



Design Technology Matrices EYFS – Year 6



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Fossebrook Design Technology Curriculum

Fossebrook Primary School enables our design technologists to become involved in, enjoy and appreciate the visual arts and discover how it can enrich their personal lives. Design technology contributes to the development of the whole child emotionally, aesthetically, physically, socially, and cognitively. We believe that every child at Fossebrook has the potential to be a design technologist. Across their primary years, our design technologists explore and learn that design technology impacts their own and others' lives, in contemporary life and in different times and cultures. They are taught confident and strong skills within the core elements of design, making, evaluating, and having the technical knowledge to build things. Cooking and nutrition is also an important factor in the lives of our design technologists and therefore, we celebrate cooking within every year group too. This provides all design technologists with the opportunity to express themselves imaginatively, creatively and safely whilst using technical tools. They learn to respond to the world around them artistically whilst developing their knowledge and understanding of various design technology elements.

Design Technology Curriculum Intent

Fossebrook's Design and technology curriculum aims to inspire pupils to be innovative and creative thinkers who have an appreciation for the product design cycle through ideation, creation, and evaluation. We want our pupils to develop the confidence to take risks, through drafting design concepts, modelling, and testing and to be reflective learners who evaluate their work and the work of others. Through our Design Technology curriculum, we aim to build an awareness of the impact of design and technology on our lives and encourage pupils to become resourceful, enterprising citizens who will have the skills to contribute to future design advancements. Our Design and technology scheme of work enables pupils to meet the end of key stage attainment targets in the National curriculum and the aims also align with those in the National curriculum. EYFS (Reception) units provide opportunities for pupils' to work towards the Development matters statements and the Early Learning Goals.

Design Technology Curriculum Implementation

The Design and technology National curriculum outlines the three main stages of the design process: design, make and evaluate. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical, and technical understanding required for each strand. Cooking and nutrition has a separate section, with a focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality. The National curriculum organises the Design and technology attainment targets under four subheadings: Design, Make, Evaluate, and Technical knowledge. Fossebrook Primary's Design and technology scheme has a clear progression of skills and knowledge within these strands and key areas across each year group.

Through Fossebrook Primary's Design and technology curriculum, our pupils respond to design briefs and scenarios that require consideration of the needs of others, developing their skills in the six key areas.

Each of our key areas follows the design process (design, make and evaluate) and has a particular theme and focus from the technical knowledge or cooking and nutrition section of the curriculum. The Fossebrook Primary scheme is a spiral curriculum, with key areas revisited again and again with increasing complexity, allowing pupils to revisit and build on their previous learning.

Lessons incorporate a range of teaching strategies from independent tasks, paired and group work including practical hands-on, computer-based and inventive tasks. This variety means that lessons are engaging and appeal to those with a variety of learning styles. Differentiated/ Adapted guidance is available for every lesson to ensure that lessons can be accessed by all pupils and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Design and Technology curriculum. Each unit of lessons includes multiple teacher videos to develop subject knowledge and support ongoing CPD.

Design Technology Curriculum Impact

The impact of Fossebrook Primary's scheme can be constantly monitored through both formative and summative assessment opportunities. Each lesson includes guidance to support teachers in assessing pupils against the learning objectives. Furthermore, each unit has a unit quiz and knowledge catcher which can be used at the start and/ or end of the unit.

After the implementation of Fossebrook Primary's Design and Technology curriculum, pupils should leave school equipped with a range of skills to enable them to succeed in their secondary education and be innovative and resourceful members of society. The expected impact of following the Fossebrook Primary Design and Technology curriculum is that children will:

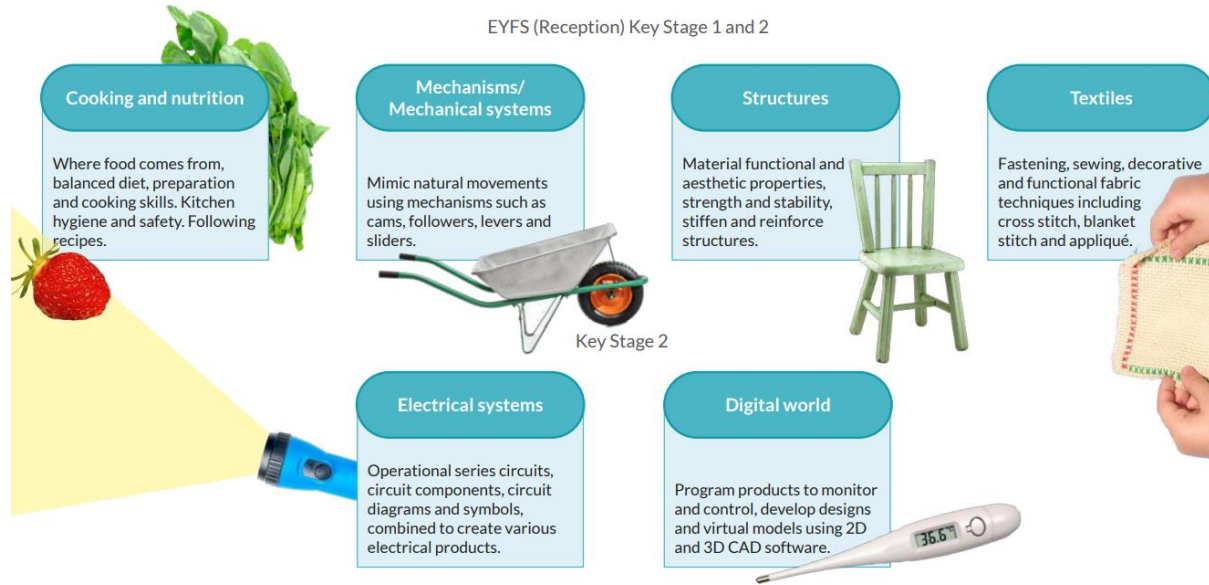
- Understand the functional and aesthetic properties of a range of materials and resources.
- Understand how to use and combine tools to carry out different processes for shaping, decorating, and manufacturing products.
- Build and apply a repertoire of skills, knowledge and understanding to produce high quality, innovative outcomes, including models, prototypes, applications, and products to fulfil the needs of users, clients, and scenarios.
- Understand and apply the principles of healthy eating, diets, and recipes, including key processes, food groups and cooking equipment.
- Have an appreciation for key individuals, inventions, and events in history and of today that impact our world.
- Recognise where our decisions can impact the wider world in terms of community, social and environmental issues.
- Self-evaluate and reflect on learning at different stages and identify areas to improve.
- Meet the end of key stage expectations outlined in the National curriculum for Design and technology.
- Meet the end of key stage expectations outlined in the National curriculum for Computing.

Year	Design and Technology National Curriculum
EYFS	<p>ELG: Expressive Arts and Design (Exploring and Using Media and Materials) Children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</p> <p>ELG: Being Imaginative and Expressive Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories</p>
Key Stage 1	<p>Technical Knowledge:</p> <ul style="list-style-type: none"> • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms for example, levers, sliders, wheels and axles cover in their products. <p>Cooking and nutrition</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from
Key Stage 2	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Apply that understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical a systems in their projects for example, gears, police, 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 programme, monitor and control their products • understanding applied 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, red, caught and processed

Fossebrook Design Technology Overview of Units

There are six elements of the DT Curriculum.

Cooking & nutrition, Structures, Mechanisms, Textiles, Electrical systems and Digital world.



	Autumn 1	Spring 1	Summer 1
EYFS	Cooking and Nutrition	Structures: Junk Modelling	Structures: Boats
Year 1	Mechanisms: Making a moving story book	Structures: Constructing a Windmill	Cooking and Nutrition: Making Smoothies
Year 2	Food and Nutrition: Making Bread Structures: Baby Bear's Chair	Mechanisms – Fairground Wheel	Mechanisms – Making a moving monster
Year 3	Cooking and Nutrition – Eating Seasonally	Structures – Constructing a castle	Digital World Wearable Technology
Year 4	Structure: Pavilions	Mechanical Systems: Making a slingshot car	Electrical Systems: Torches
Year 5	Electrical Systems: Doodlers	Mechanical Systems: making a Pop-Up Book	Cooking and Nutrition: Developing a recipe
Year 6	Structures - Playgrounds	Textiles: Stuffed Toys	Digital World: Monitoring Devices

Substantive and Disciplinary Knowledge and Concepts in Design Technology

Art and Design education is crucial in developing pupils' creative thinking, critical analysis, and appreciation of cultural heritage. The Kapow curriculum offers a structured approach to teaching Art and Design, emphasising both substantive and disciplinary concepts. Substantive knowledge sets out the subject-specific content that is to be learned - i.e. the Art & Design Curriculum units This is the fingertip (specific) knowledge that children will learn and retain from each unit of work whereas the substantive concepts are the methods, techniques, media, materials, the formal elements and skills as well as the knowledge of artists. Disciplinary knowledge tells us how we know what we know; it is through disciplinary knowledge that pupils learn and use the skills needed to understand how to be an effective artist. Disciplinary concepts help us to ask questions such as: what is art? Why do people make art? And How do people talk about art?

Substantive Concepts in Design Technology

At Fossebrook, we recognise that in design technology, primary school children are introduced to four key concepts. These concepts help them understand and create meaningful creations.

The essential ideas which we focus on are:

- Design
- Make
- Evaluate
- Technical Knowledge

The substantive knowledge sets out the subject-specific content that is to be learned - i.e. the DT Curriculum units This is the fingertip (specific) knowledge that children will learn and retain from each unit of work.

Disciplinary Concepts in Design Technology

There are four areas for Disciplinary Concepts which are Responsibility, Similarity and Difference, Cause and Consequence and Expression. Each concept is vital for a design through to a robust end project. Disciplinary Knowledge tells us how we know what we know; it is through disciplinary knowledge that pupils learn and use the skills needed to understand how to be an effective designer technologist.

DT Statutory Guidance and EYFS Framework

Substantive Knowledge

Substantive Concepts
Disciplinary Concepts
Design
Make
Evaluate
Technical Knowledge

Substantive Knowledge

- Key facts and skills associated with the unit of work

Disciplinary Knowledge

Responsibility
Similarity and difference
Cause and consequence
Expression

Disciplinary Knowledge

Specific skills and approaches developed to exploring DT

Adapting the curriculum for pupils with SEND

Adaptive teaching takes place.

- For sensory or physically impaired pupils, art and design learning may necessitate enlarging texts, using clear fonts, using visual overlays, or audio description of images.
- Dyslexic pupils may benefit from well-spaced print.
- Teachers identify and break down the components of the subject curriculum into manageable chunks for pupils who find learning more difficult, particularly those with cognition and learning needs. These may be smaller 'steps' than those taken by other pupils to avoid overloading the working memory.
- A variety of additional scaffolds may be used in lessons, such vocabulary banks, additional visual stimuli or adult support.

Key Stage	Responsibility (working safely, how design can solve problems, choosing the right materials, responsibilities to customers to ensure quality / reliable products, healthy eating, quality ingredients)	Similarity and difference: (making comparisons, noting differences and drawing conclusions)	Cause and consequence: (identifying how things work, how an action can cause change/movement)	Expression: (Using terminology, evaluating, creating accurate designs, labelling and annotating, explaining processes, presenting)
Early Years	Learn to use simple equipment safely and appropriately.	Talk about how things feel are they hard, soft, smooth, rough, strong or weak.	Explore the purpose of a product.	Children communicate their ideas through talking & drawing
Key Stage 1	Learn to use hand tools and kitchen equipment safely and appropriately and learn to follow hygiene procedures.	Compare two materials and their properties.	Explore purposeful, functional, appealing products for themselves and other users based on design criteria.	Children communicate their ideas through talking & drawing
Lower Key Stage 2	Learn to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures.	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.	Use research and develop design criteria to inform the design of innovative, functional & appealing products that are fit for purpose.	Children generate, develop, model and communicate their ideas through talking, drawing and where appropriate, information and communication technology.
Upper Key Stage 2	Learn to use a wider range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures.	Use a full range of materials and components and compare between materials.	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.

EYFS Substantive Knowledge

Unit Title	Drawing: Marvellous Marks	Craft and Design: Let's Get Crafty	Sculpture and 3D: Creation Station
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> • I can explore making marks with wax crayons. • I can investigate the marks and patterns made by different textures. • I can explore making marks with felt tips. • I can use a felt tip to make patterns. • I can explore making marks with chalk. • I can make controlled large and small movements. • I can compare different ways of making marks and drawing. • I can explore mark making using pencils. • I can create a simple observational drawing. • I can use a variety of colours and materials to create a self-portrait. • I can express my own self-image through art. 	<ul style="list-style-type: none"> • I can develop scissor skills. • I can develop threading skills. • I can learn about the different ways in which we can join materials together and to practise these techniques. • I can learn how to fold, curl and cut paper to achieve a desired effect. • I can create a design for a tissue paper flower. • I can refine small motor skills through the use of drawing, cutting and manipulating paper. 	<ul style="list-style-type: none"> • I can explore clay and its properties. • I can explore playdough and its properties. • I can use tools safely and with confidence. • I can create natural 3D landscape pictures using found objects. • I can generate inspiration and conversation about sculpture art and artists. • I can create a design for a 3D animal sculpture. • I can begin making a 3D clay sculpture using the designs created last lesson. • I can share my creation, explaining the processes they have used.

Year 1 Substantive Knowledge

Unit Title	Mechanisms: Making a moving story book	Structures: Constructing a Windmill	Food and Nutrition: Making Smoothies
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> describing the direction that something moves using up, down, left and right; identifying whether a mechanism is a side-to-side slider or an up-and-down slider; identifying what movement the mechanism will make; cutting slots and inserting sliders to demonstrate the mechanism. labelling drawings to show which parts of their design will move and in which direction. assembling a moving storybook which meets the design criteria; creating moving parts that move purposefully and as planned. evaluating their design's strengths and weaknesses; suggesting alterations to their design. 	<ul style="list-style-type: none"> finding the centre of the base of a paper cup; following instructions to puncture a hole using a pencil; adding modelling dough to a paper cup to add weight. holding scissors in one of two correct grips; finding the middle of the base of a cup and piercing a hole; making cuts with some even spacing and length; folding the flaps to create the shape of the windmill blades. using a pencil to widen a hole where needed; attaching a cocktail stick to attach a supporting structure to the sails; testing their windmill with their finger and by blowing. checking their windmill to see if it is stable and the blades move; improving the design by adding more weight or modifying the structure; discussing suitable colour choices. 	<ul style="list-style-type: none"> naming fruits and vegetables; identifying seeds; classifying a food as a fruit or non-fruit. naming places where vegetables grow (aboveground and underground); naming places where fruits grow (aboveground, on bushes, trees, vines); using prior knowledge to decide whether produce will grow aboveground or underground. using a table knife safely to chop foods into equal pieces; using a fork to secure foods when cutting; extracting juice from a fruit with a manual juicer; identifying equipment used for each skill. following instructions to choose two fruits and a juice they like to create a smoothie; describing the taste, smell and look of different fruits following a recipe to create a smoothie; identifying which ingredients to chop and which to juice; using their senses to describe and compare smoothies. creating a carton design for a smoothie; deciding on the recipe they liked best after a discussion; discussing whether their smoothie fulfilled a design brief.

Year 2 Substantive Knowledge

Unit Title	Food and Nutrition: Making Bread Structures: Baby Bear’s Chair	Mechanisms – Fairground Wheel	Mechanisms – Making a moving monster
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> • I can cut food safely • I can describe the ingredients I am using • I know what makes a balance diet (science link) • I know where food comes from • Identifying man-made/natural structures. Contributing to discussions. Identifying stable and unstable structural shapes. Identifying features that make a chair stable • Explaining the definition of strength. Identifying the strongest and weakest shaped and part of a structure. Making and testing a structure • Working independently to use the materials as demonstrated to begin to make a stable structure. Explaining how their ideas would be suitable for the given brief • Producing a model that satisfies the given brief, using the appropriate materials and construction techniques and explaining how they made it strong, stiff and stable 	<ul style="list-style-type: none"> • Designing and labelling a wheel, considering the designs of others and making comments about their practicality or appeal • Considering the materials, shape, construction and mechanisms of the wheel and labelling the design • Building a stable structure with a rotating wheel and testing and adapting the design as necessary • Following a design plan to make a completed model of the wheel 	<ul style="list-style-type: none"> • Using key terms accurately. Identifying the correct terms for levers, linkages and pivots. Analysing popular toys with the correct terminology • Creating functional linkages that produce the desired input and output motions • Designing monsters suitable for children, which satisfy most of the design criteria. Selecting the suitable linkage system to produce the desired motions. Evaluating two designs against the design criteria, and deciding selecting a favourite based on this and the feedback of their peers • Selecting and assembling materials to create planned monster features. Assembling the monster to the linkages without affecting the function of them. Evaluating the final product against the design criteria

Year 3 Substantive Knowledge

Unit Title	Cooking and Nutrition – Eating Seasonally	Structures – Constructing a castle	Digital World Wearable Technology
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> Identifying fruits and vegetables that cannot be grown in the UK; demonstrating an understanding that different climates enable different fruits and vegetables to grow. Acknowledging that imported food travels from far away and has an environmental impact; understanding that vegetables and fruits grow in certain seasons, leading to the UK importing food when it is not in season; using knowledge of seasonal foods to find recipes that fit design criteria. Identifying equipment used for preparing food by matching specific food items with the appropriate piece of equipment; justifying the use of a specific piece of equipment with a type of food; recalling safety rules for the preparation equipment used in the lesson. Identifying what foods are currently in season; tasting various fruits and vegetables to describe their flavours and contribute to the class taste wheel; expressing preferences for the ingredients tasted and explaining which ones would work well together in a tart. Designing a puff pastry tart using seasonal vegetables and fruits; understanding that each vegetable and fruit provides nutritional benefits. Tasting tarts and providing feedback, considering taste, texture, appearance, and use of seasonal ingredients; receiving and reflecting upon feedback from classmates and identifying strengths in their own tart. 	<ul style="list-style-type: none"> Drawing a simple castle that includes the most common features and labelling the drawing Drawing a simple castle that includes the most common features and labelling the drawing Constructing a range of 3D geometric shapes using a net by: Building a complex structure from simple geometric shapes. Evaluating own work by answering simple question 	<ul style="list-style-type: none"> Explaining who might use a product; recognising the function of a product. Developing specific criteria so that a product fits the needs of those who will most likely use it. Writing a program that initiates a flashing LED panel when a button is pressed; checking code against an example that is correct to check for errors and debug. Creating a drawing of a product that represents an idea of how the final product could look; explaining to a user what each feature on the product does using annotations. Describing what is meant by 'point of sale display' and giving an example; following simple design requirements; using computer-aided design software to create a POS badge; evaluating their design.

Year 4 Substantive Knowledge

Unit Title	Structure: Pavilions	Mechanical Systems: Making a slingshot car	Electrical Systems: Torches
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> Producing a range of free standing frame structures of different shapes and sizes Designing a pavilion that is strong, stable and aesthetically pleasing, including a range of materials to create a desired effect Selecting appropriate materials and construction techniques to create a stable, free-standing frame structure for the pavilion which clearly reflects the design Selecting appropriate materials and techniques to add cladding to their pavilion which clearly reflects the chosen theme and the design criteria 	<ul style="list-style-type: none"> Working independently to produce an accurate, functioning car chassis Designing a shape that is suitable for the project and making some attempt to reduce air resistance through the design of the shape Producing panels that will fit the chassis and can be assembled effectively using the tabs they have designed Constructing the car bodies effectively. Conducting the trial accurately and drawing conclusions and improvements from the results 	<ul style="list-style-type: none"> Identifying electrical products and explaining why they are useful and helping to make a working switch Identifying the features of a torch, how it works and describing what makes a torch successful Creating suitable designs which fit both the success criteria and their personal design criteria Creating a functioning torch with a switch according to their design criteria

Year 5 Substantive Knowledge

Unit Title	Electrical Systems: Doodlers	Mechanical Systems: making a Pop-Up Book	Cooking and Nutrition: Developing a recipe
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> I can explain what retrofuturism is. I can use simple responses and formal elements to evaluate images. I can provide plausible suggestions for how a piece was created. I can draw from various stimuli comfortably. I can use a range of drawing processes based on past experiences. I can select and place textures to create collagraph plates, supported by testing. I can produce drawings and visual notes to explore ideas. I can create clear compositions for final pieces. I can apply skills to make effective collagraph prints. I can choose tools and drawing techniques with some guidance. I can discuss ways to improve work and seeking support when needed. 	<ul style="list-style-type: none"> Producing a suitable plan for each page, naming each type of mechanism, input and output and understanding that structures use the movement of the pages to work and mechanisms control movement Producing the structure of the book and beginning to draw and assemble the components necessary for the first structures/mechanisms Assembling the components for all the required structures/mechanisms and hiding the relevant parts of the mechanisms with more layers using spacers where needed Using a range of mechanisms and structures to illustrate the story and making it interactive. Using layers to hide mechanical elements and illustrating the story through the use of appropriate materials and caption 	<ul style="list-style-type: none"> Identifying the ingredients in spaghetti Bolognese; understanding how beef gets from the farm to our plates; presenting the subject of their poster with clear and relevant information. Stating preferences when tasting Bolognese sauces; naming a few unique ingredients that could be found in different Bolognese recipes; making simple changes to a basic Bolognese recipe to enhance it. Stating preferences when tasting Bolognese sauces; naming a few unique ingredients that could be found in different Bolognese recipes; making simple changes to a basic Bolognese recipe to enhance it. Stating preferences when tasting Bolognese sauces; naming a few unique ingredients that could be found in different Bolognese recipes; making simple changes to a basic Bolognese recipe to enhance it. Measuring accurately and constructing a rectangle; creating a label that includes relevant colour choices, ingredients and the jar's contents; using a checklist to evaluate someone else's design. Preparing the right quantities of ingredients using measurements where necessary; selecting the right equipment to prepare foods in the way they intended; explaining a recipe, how they adapted it and why it is unique.

Year 6 Substantive Knowledge

Unit Title	Structures - Playgrounds	Textiles: Stuffed Toys	Digital World: Monitoring Devices
Substantive Concepts	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge	Design Make Evaluate Technical Knowledge
Substantive Knowledge	<ul style="list-style-type: none"> Communicating five apparatus designs, applying the design criteria and making suitable changes after peer evaluation Making roughly three different structures from their plans using the materials available Completing their structures, improving on the quality of making from the previous lesson and applying cladding to a few areas Securing the apparatus to a base and making a range of landscape features from a range of materials which enhance the apparatus 	<ul style="list-style-type: none"> designing a stuffed toy considering the main component shapes required; creating an appropriate template. joining two pieces of fabric using a blanket stitch; neatly cutting out their fabric; threading a needle independently. using appliqué or decorative stitching to decorate the front of their stuffed toy. using a blanket stitch to assemble their stuffed toy; repairing when needed; identifying what worked well and areas for improvement. 	<ul style="list-style-type: none"> describing what is meant by monitoring devices and providing an example; explaining briefly the development of thermometers from thermoscopes to digital thermometers; researching a chosen animal's key information to develop a list of design criteria. writing a program that monitors the ambient temperature and alerts someone with a visual and/or audible alert when the temperature drops below or above a specified range; suggesting where there are bugs in the code and ways to fix them by comparing their program to a finished example or by retracing steps; explaining in basic terms the functions of the program and how they will be useful for an animal carer. stating one or two facts about the history and development of plastic, including how it is affecting planet Earth; building a variety of brick models to invent case, housing, and stand ideas that do not obstruct the LED display or buttons; describing the features of their favourite model and what makes it successful. explaining key pros and cons of virtual modelling vs physical modelling; recalling and describing the name and use of key tools used in Tinkercad; fulfilling the design requirements of the 3D virtual model.