YEAR	AUTUMN TERM	SPRING TERM	SUMMER TERM
Foundation stage **Continuous opportunities in provision in FS (not bound by terms)**	Designing Children will: • Talk about what they want to make and who it is for. • Share ideas through discussion, drawing, role play and modelling. • Explore different materials and resources before making choices. • Begin to solve simple problems and think about how things can be improved. • Develop confidence in expressing their own ideas and preferences. Making Children will: • Construct using a variety of materials including paper, card, fabric, construction kits and recycled materials. • Join materials using simple techniques such as gluing, taping, slotting, folding and tying. • Use a range of tools safely, including scissors, hole punches, rolling pins and cutters with supervision. • Build structures and models for a purpose. • Follow simple instructions and begin to work independently. Evaluating Children will: • Talk about what they have made and how they made it. • Explain what they like about their work. • Identify what worked well and what they might change next time. • Compare their creations with those of others. • Respond positively to feedback and suggestions. Technical Knowledge Children will: • Explore how everyday objects work. • Investigate different materials and their properties. • Understand that different materials are suitable for different purposes. • Begin to recognise simple mechanisms such as wheels, axles and moving parts through play and exploration. • Explore how structures can be made stronger, stiffer and more stable.		

	Food and Nutrition Children will: • Learn about healthy foods and making healthy choices. • Explore where food comes from. • Prepare simple foods safely and hygienically. • Use basic kitchen tools with supervision. • Taste and evaluate different foods. Construction and Engineering Children will: • Build with blocks, bricks and construction kits. • Create enclosures, towers, bridges and other structures. • Test ideas and adapt designs when things do not work as expected. • Develop spatial awareness and problem-solving skills. • Explore balance, stability and strength through practical experiences. Fine Motor Skills Supporting DT Children will: • Develop hand strength and coordination. • Use one-handed tools safely and effectively. • Cut along simple lines. • Manipulate small objects and construction materials. • Thread, weave, mould and shape materials.

Year 1	**FRAME STRUCTURES: Bridges** **Builds on – knowledge of structures and how to make them from EYFS** **Description** This unit introduces pupils to structures. It focuses on bridge building and introduces cutting, folding, and joining techniques. Pupils make their own bridges, applying their knowledge of structure design. **Why this? Why now?** Foundation knowledge of structures and how to make them is fundamental to Key Stage 1. This unit builds upon the knowledge of structures from the Early Years Foundation Stage. By introducing cutting, folding, and joining techniques, pupils can access the subsequent curriculum. This unit provides key knowledge for future structure units on 'Levers and sliders: moving cards' and 'Freestanding structures: playgrounds'. **Prior knowledge requirements** • Pupils can use simple tools, such as scissors, appropriately. • Pupils can use simple joining skills, such as glue sticks, appropriately. • Pupils can built structures from simple construction kits.	**ROTARY MECHANISMS: WINDMILLS** **Builds on - EYFS - knowledge of mechanisms creating movement explored through simple construction kits in EYFS** **Description** This unit introduces knowledge of simple rotary mechanisms that create movement. Pupils will investigate how windmills work, consider sail design, and produce a working model that will be tested for stability and movement. **Why this? Why now?** Understanding how mechanisms work starts with simple systems. This unit builds upon knowledge of mechanisms creating movement explored through simple construction kits during the Early Years Foundation Stage. Knowledge of axles and sails creating movement is a precursor to knowledge developed within the 'Wheels and axles: vehicles' unit. **Prior knowledge requirements** • Pupils can join construction pieces together to build and balance. • Pupils can use a variety of construction materials. • Pupils can talk about their design ideas and what they are making. • Pupils can select from a range of tools and materials.	**TEXTILES (Templates in textiles)** Glove/hand puppets **Builds on – exploring different fabrics during EYFS and having knowledge of some of their properties** **Description** This unit develops pupils' knowledge of the characteristics of non-woven fabrics and their joining techniques. Pupils analyse the techniques used to make fabric products and then apply this knowledge by designing and making a fabric puppet. **Why this? Why now?** Understanding how textile products are assembled builds the foundation for future textile units. Pupils will have explored different fabrics during the Early Years Foundation Stage and have knowledge of some of their properties. Knowledge and skills within this unit focus on non-woven fabrics and simple joining techniques. It lays the foundations for the future textiles unit in '2D shapes to 3D products: stationery storage'. **Prior knowledge requirements** • Pupils have explored and used different fabrics. • Pupils have cut and joined fabrics with simple techniques • Pupils understand that products have a purpose and an end user.
Continuous opportunities in provision in Y1	• Use construction kits to build walls, towers and frameworks. • Assemble vehicles with moving wheels using construction kits.		

Year 2	**UNIT: MECHANISMS (Sliders and levers)** Christmas card **Builds on - Y1 Autumn 1 - knowledge of folding and joining techniques** **Description** This unit develops pupils' knowledge of simple mechanisms. By making levers and sliders, pupils will apply their knowledge of the characteristics of paper and card to make their own moving cards. **Why this? Why now?** Developing knowledge of how to make things move using levers and sliders is a foundation of Key Stage 1. Cutting and folding card effectively and safely when creating simple mechanisms is also essential knowledge. This unit uses knowledge of folding and joining techniques developed in the Year 1 'Frame structures: bridges' unit. This unit is a precursor to the Year 4 'Levers and linkages unit. **Prior knowledge requirements** • Pupils have experiences of working with paper and card to make simple flaps and hinges. • Pupils have experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.	**MECHANISMS (Wheels and axles)** Fire engines **Builds on - Y1 Spring – rotary mechanisms: windmills** **Description** This unit develops pupils' knowledge of wheels and axles. The characteristics of woods will be introduced. Pupils will analyse different vehicles and their structure to design and make their own vehicle. **Why this? Why now?** Knowledge of how wheels and axles create movement is vital to understanding how vehicles work. This unit builds upon the Year 1 'Rotary mechanisms: windmills' unit where simple mechanisms were introduced through the use of an axle and sails. Knowledge of frame structures is introduced and will be further developed within the Year 5 'Pulleys and gears: electric vehicles' unit when they add electrical circuits, reversible switches and pulley systems. **Prior knowledge requirements** • Pupils have assembled vehicles with moving wheels using construction kits. • Pupils have explored moving vehicles through play. • Pupils have some experience of designing, making and evaluating products for a specified user.	**UNIT: STRUCTURES (free standing structures)** A chair for____ **Builds on - Y1 Autumn - Frame Structures: bridges** **Description** This unit develops pupils' knowledge of freestanding structures and how to make them more stable. Pupils will analyse different structures, shapes and construction techniques to make a chair for baby bear. **Why this? Why now?** Designers can identify solutions to design problems through inspiration of structures in the environment that surrounds them. Pupils will be familiar with the chairs in the home and within the school setting and will have developed knowledge of structures through the Year 1 'Structures: bridges' unit. This unit will be the foundation for prototyping that is further explored in the Year 3 'Shell structures: packaging' unit. **Prior knowledge requirements** • Pupils have experience of using construction kits to build walls, towers and frameworks. • Pupils have experience of using of basic tools such as scissors or hole punches with construction materials such as plastic, card.

Year 3	**MECHANICAL SYSTEMS (Pneumatics)** Moving toys **Builds on - Y1 Spring – Rotary mechanisms: windmills** **Description** This unit introduces pupils to creating movement with air using pneumatic mechanisms. They will then apply this knowledge to develop a moving toy. **Why this? Why now?** Designing and making a range of mechanical systems provides a deeper of understanding of mechanisms. This unit builds upon knowledge of combining and joining mixed materials during the Year 1 'Rotary mechanisms: windmills' unit. Teachers can amplify this unit to choose different contexts developing design skills and knowledge within the concept of pneumatics. The technical knowledge can be applied in the Year 4 'Levers and linkages' unit and materials knowledge is built upon within the Year 4 'Simple programming and control: light display' unit. **Prior knowledge requirements** • Pupils have explored simple mechanisms, such as sliders and levers, and simple structures. • Pupils have learnt how materials can be joined to allow movement. • Pupils have joined and combined materials using simple tools and techniques.	**TEXTILES (2d TO 3D shapes, design for purpose)** Pencil cases/money holder **Builds on - Y1 Summer – Templates in textiles - puppets** **Description** This unit develops pupils' knowledge and joining techniques when working with woven fabrics. Pupils test and select recycled fabric for functionality. They will use templates and decorative techniques to make a storage product. **Why this? Why now?** Creating a product for an authentic purpose is a fundamental aspect of design. This unit builds upon the Year 1 'Templates in textiles: puppets' unit where pupils were introduced to the characteristics of non-woven fabrics and joining techniques. Sustainability is promoted as pupils choose to upcycle fabrics to meet a purpose from the design brief. The knowledge of fabric properties and template design is built upon further in the Year 5 'Using CAD in textiles: pattern design' unit. **Prior knowledge requirements** • Pupils have joined fabric in simple ways by gluing and stitching. • Pupils have used simple patterns and templates for marking out.	**SHELL STRUCTURES (Packaging)** **Builds on – Y2 Spring- freestanding structures** **Description** This unit develops pupils' knowledge of shell structures. They will critique the packaging of a given product and investigate the sustainability of materials, to create a new packaging design considering its environmental impact. **Why this? Why now?** Giving pupils the opportunity to design without making allows for a greater focus on the design strategies that can be used. Pupils will apply their knowledge of manipulating and joining card from the Year 2 'Freestanding structures: playgrounds' unit to investigate and develop knowledge of packaging design. They will create their own user centred design and make a prototype and branding for a specific product. The structural knowledge developed within this unit will aid pupils within the Year 5 'Frame structures using 3D CAD: sustainable housing' unit. **Prior knowledge requirements** • Pupils have experience of using different joining, cutting and finishing techniques with paper and card. • Pupils have a basic understanding of 2D and 3D shapes in mathematics. • Pupils have a basic understanding of the physical properties and everyday uses of materials.

Year 4	**MECHANICAL SYSTEMS (Levers and linkages)** Moving figure or interactive book (POAP) **Builds on – Y2 Autumn Levers and sliders: moving cards** **Description** This unit develops pupils' knowledge of mechanisms through levers and linkages. They will apply this knowledge by exploring mechanisms and incorporating them into an interactive book with a user-centred focus. **Why this? Why now?** Identifying mechanical systems and relating these to authentic real life products is essential for pupils to be able to design and make their own systems. This unit builds upon the Year 2 'Levers and sliders: moving cards' unit and teaches pupils the knowledge and science within more complicated levers and linkages. The mechanical system knowledge learnt in this unit is further developed in the Year 6 'Cams: automata' unit. **Prior knowledge requirements** • Pupils have explored and used mechanisms such as flaps, sliders and levers. • Pupils have gained experience of basic cutting, joining and finishing techniques with paper and card. • Pupils have developed some cutting, joining and finishing skills with card.	**EXTENDED FOOD UNIT** **OR** **TEXTILE PATTERN PIECES: hats and caps** **Builds on – Y3 Spring Textiles – 2D to 3D shapes** **Description** This unit introduces pupils to more complex textile products, enabling them to produce fabric patterns. Pupils will develop knowledge of fabrics and apply this by selecting them for functionality and aesthetics to design a product. **Why this? Why now?** Designers, including fashion designers, use various methods to communicate design ideas, including pattern net design. Pattern nets can be used to develop their understanding of the form of textile products while also exploring knowledge of different fabrics. This unit builds upon the knowledge of joining fabric templates attained within the Year 3 '2D shapes to 3D products: stationery storage' unit. This knowledge is developed when designing and making during the Year 5 'Combining fabrics: accessible textiles' unit. **Prior knowledge requirements** • Pupils have experience of stitching, joining and finishing techniques in textiles. • Pupils have experience of making and using textiles pattern pieces.	**ELECTRICAL SYSTEMS (Data loggers)** **Builds on – Y3 Pneumatics: moving toys** **Description** This unit develops pupils' knowledge of simple circuits, programming and control. Fault finding of circuits will be introduced. Pupils will learn how to integrate a BBC Micro:bit in a simple circuit and use sensors to program a light display. **Why this? Why now?** Understanding control systems is fundamental to integrating micro-controllers within products. This unit builds upon the materials knowledge in the Year 3 'Pneumatics: moving toys' unit. Knowledge of simple series circuits and switches will have been developed and can be applied and amplified with the learning of micro-controllers. The knowledge and understanding in this unit is built on further in the Year 6 'Systems and control: sensor alarm' unit. **Prior knowledge requirements** • Pupils have constructed simple series electrical circuits, using bulbs, batteries, switches and buzzers. • Pupils have cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.

Year 5	**TEXTILES** **(Combining fabrics: accessible textiles)**	**STRUCTURES** **(Frame Structures including CAD)** Sustainable housing	**MECHANICAL SYSTEMS** **(Pulleys and Gears)** Electric cars
	Description This unit develops pupils' knowledge and 3D joining techniques when working with woven fabrics. Accessible design is introduced by investigating the work of fashion designers. Pupils apply this knowledge and understanding to make and promote an accessible product. **Why this? Why now?** Developing empathy for a specific user allows designers to produce products with a user-centred focus. In this unit, pupils build upon knowledge of templates and user-centred design found in the Year 4 'Using CAD in textiles: pattern design' unit and develop a wider range of fabric joining techniques from the Year 3 '2D shapes to 3D products: stationery storage' unit. **Prior knowledge requirements** • Pupils have experience of basic stitching, joining textiles and finishing techniques. • Pupils have experience of making and using simple pattern pieces.	**Description** This unit introduces 3D Computer Aided Design to pupils. They will investigate modern architects to understand the techniques and materials they use in sustainable housing. They will develop knowledge of TinkerCAD to design and present a model sustainable house. **Why this? Why now?** Understanding how to use various Computer Aided Design applications widens a designer's knowledge, allowing them to use the correct tools for the proper purpose. Pupils will have used Computer Aided Design in the previous Year 5 unit, 'Using CAD in textiles: pattern design'. This unit introduces 3D modelling and focuses on designing digital solutions while building on Key Stage 1 sustainability design units. Pupils' knowledge of architectural design to inspire pupil work will be developed, supporting the Year 6 'Products and people: inspirational design' unit. **Prior knowledge requirements** • Pupils have experience of different joining, cutting and finishing techniques with materials. • Pupils have a basic understanding of 2D and 3D shapes in mathematics. • Pupils have a basic understanding of the physical properties and everyday uses of materials. • Pupils have experience of simple computer-aided design applications.	**Description** This unit develops pupils' knowledge of mechanisms through gears and pulleys. By investigating electric vehicles and mechanical and electrical components, pupils will apply their knowledge and understanding by making an electric vehicle. **Why this? Why now?** Including electrical and mechanical components in products develops pupils' knowledge and understanding of systems. Testing products allow pupils to evaluate and improve their designs. This unit develops pupils' knowledge of electronics from the Year 4 'Simple programming and control: data loggers unit. Techniques for making frame structures are developed from the Year 5' Frame structures using 3D CAD: sustainable housing' unit. Mechanical systems knowledge is further built on in the Year 6 'Cams: automata' unit. **Prior knowledge requirements** • Pupils have experience of axles, axle holders and wheels that are fixed or free moving. • Pupils have a basic understanding of electrical circuits, simple switches and components. • Pupils have experience of cutting and joining techniques with a range of materials including card, plastic and wood. • Pupils understand how to strengthen and stiffen structures.

6	**MECHANICAL SYSTEMS (Cams: automata)** **Builds on – Y5 pulleys and gears electric vehicles** **Description** This unit develops pupils' knowledge of mechanisms through cams. Pupils will develop knowledge of the properties of wood and apply this by selecting suitable materials for functionality. Knowledge of wood construction and joining techniques are introduced and applied through making an automaton. **Why this? Why now?** Pupils will apply their knowledge and understanding of mechanisms learnt throughout Key Stage 1 and 2 to make an automata. Pupils' knowledge of woods, their properties and joining techniques will be developed further from the Year 5 'Pulleys and gears: electric vehicles' unit. The knowledge built in this unit will be developed further in KS3. **Prior knowledge requirements** • Pupils have experience of axles, axle holders and wheels that are fixed or free moving. • Pupils have a basic understanding of different types of movement. • Pupils have experience of cutting and joining techniques with a range of materials including card, plastic and wood.	**(ELECTRICAL SYSTEMS (Monitoring and control)** Sensor alarm **Builds on – Y4- electrical systems simple programming and control – data loggers** **Description** This unit develops pupils' programming and control knowledge, with a focus on monitoring. Debugging and troubleshooting will be introduced. Pupils will learn how to integrate a BBC Micro:bit in a product and use sensors to program a light display. **Why this? Why now?** Micro-controllers are a fundamental aspect of the electrical products we use every day. Pupils will create algorithms that monitor input to control output, building on programming and embedding micro-controllers into designs from the Year 4 'Simple programming and control' unit. The systems and control knowledge gained from this unit will support learning within KS3. **Prior knowledge requirements** • Pupils have initial experience of using computer control software and an interface box, a standalone box or microcontroller, such as a Micro:bit or Crumble. • Pupils have some experience of writing and modifying a program to make a light turn on or flash on and off. • Pupils have an understanding of the essential characteristics of a series circuit and experience of creating a battery.	**FOOD UNIT And/or transition unit of** **PRODUCTS AND PEOPLE: Inspirational design** **Builds on – knowledge of materials and designers throughout the primary curriculum** **Description** This unit introduces pupils to key individuals and products from the product design and fashion industries that have shaped our world. Pupils will complete design tasks that develop their knowledge and understanding of designers and their products while critiquing the materials and techniques used. **Why this? Why now?** Understanding how key events and individuals in design and technology have helped shape the world inspires pupils when designing and making. This unit builds upon the knowledge of materials and designers throughout the primary curriculum. It is designed to bridge the Key Stage 2 to Key Stage 3 transition and ensure fundamental knowledge and vocabulary are directly correlated to units in Key Stage 3. **Prior knowledge requirements** • Pupils have an understanding that a large portion of the world around them has been designed and made. • Pupils have an awareness of brand names and/or companies. • Pupils have knowledge of materials used throughout the primary curriculum.