

	Term 1	Term 2	Term 3
Unit of work	Structures Frame structures	Textiles Combining different fabric shapes	Electrical Systems Monitoring and control
Composite Knowledge	What is a frame structure? How can we join our frame structure? What is triangulation and how does it help?	How can we combine different fabric shapes? What impact have different designers had on fabrics and products? How can we strengthen/stiffen a product?	How to design, make and evaluate a motion sensor light to illuminate for security.
Component knowledge	Describe what a simple frame structure is and observe frame structures in the local area Observe and construct a variety of different methods to join a frame structure Recognise triangulation in frame structures and understand that it helps to strengthen and reinforce the structure	Demonstrate a variety of stitches used to join fabrics Observe and describe the impact different designers have had on fabrics and products Demonstrate different techniques we can use to strengthen/stiffen a product	Develop a design specification for a functional product that responds automatically to changes in the environment. Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. Create and modify a computer control program to enable their electrical product to respond to changes in the environment. Continually evaluate and modify the working features of the product to match the initial design specification.
National Curriculum KS2 (skills)	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 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		

	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.		
Vocabulary	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent	computer aided design (CAD), computer aided manufacture (CAM) font, lettering, text, graphics, menu, scale, modify, repeat, copy, flip design brief, design criteria, design decisions, innovative, prototype seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces names of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper annotate, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype	reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device, series circuit, parallel circuit, function, innovative, design specification, design brief, user, purpose
Links to prior knowledge	Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.	Experience of stitching, joining and finishing techniques in textiles. Experience of making and using textiles pattern pieces. Experience of simple computer-aided design applications.	Initial experience of using computer control software and an interface box, a standalone box or microcontroller, e.g. Crumble. Some experience of writing and modifying a program to make a light turn on or flash on and off. Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.