**Progression of knowledge and skills for Design Technology (Layer 2)**

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Design** | Generate ideas based on simple design criteria and their own experiences, explaining what they could make.  Develop, model and communicate their ideas through drawings and mock-ups with card and paper. | Generate initial ideas and simple design criteria through talking and using own experiences.  Develop and communicate ideas through drawings and mock-ups.  Design a functional and appealing product for a chosen user and purpose based on simple design criteria.  Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology | Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product.  Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.  Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user.  Use annotated sketches and prototypes to develop, model and communicate ideas | Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.  Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.  Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.  Produce annotated sketches, prototypes, final product sketches and pattern pieces. | Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources.  Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.  Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.  Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.  Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. | Generate innovative ideas by carrying out research including surveys, interviews and questionnaires.  Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design.  Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.  Develop a design specification for a functional product that responds automatically to changes in the environment.  Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams. |
| **Make** | Plan by suggesting what to do next.  Select and use tools, explaining their choices, to cut, shape and join paper and card.  Use simple finishing techniques suitable for the product they are creating.  Select new and reclaimed materials and construction kits to build their structures. | Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing.  Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.  Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing.  Select from and use textiles according to their characteristics. | Order the main stages of making.  Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.  Explain their choice of materials according to functional properties and aesthetic qualities.  Use finishing techniques suitable for the product they are creating.  Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.  Select from and use finishing techniques suitable for the product they are creating. | Plan the main stages of making.  Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.  Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.  Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities | Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.  Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.  Use finishing and decorative techniques suitable for the product they are designing and making.  Produce detailed lists of tools, equipment and materials.  Formulate step-by-step plans and, if appropriate, allocate tasks within a team.  Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.  Work within the constraints of time, resources and cost. | Produce detailed lists of equipment and fabrics relevant to their tasks.  Formulate step-by-step plans and, if appropriate, allocate tasks within a team.  Select from and use a range of tools and equipment to make products that are accurately assembled and well finished.  Work within the constraints of time, resources and cost.  Formulate a step-by-step  plan to guide making, listing  tools, equipment, materials  and components.  Competently select and  accurately assemble  materials, and securely  connect electrical  components to produce a  reliable, functional product.  Create and modify a  computer control program to  enable their electrical  product to respond to  changes in the environment. |
| **Evaluate** | Explore a range of existing books and everyday products that use simple sliders and levers.  Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.  Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria. | Explore and evaluate a range of products with wheels and axles.  Evaluate their ideas throughout and their products against original criteria.  Explore and evaluate a range of existing textile products relevant to the project being undertaken. | Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used.  Test and evaluate their own products against design criteria and the intended user and purpose.  Investigate and analyse books and, where available, other products with lever and linkage mechanisms.  Evaluate their own products and ideas against criteria and user needs, as they design and make. | Investigate a range of 3-D textile products relevant to the project.  Test their product against the original design criteria and with the intended user.  Take into account others’ views.  Understand how a key event/individual has influenced the development of the chosen product and/or fabric.  Investigate and analyse a range of existing battery-powered products.  Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. | Investigate and evaluate a range of existing frame structures.  Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.  Research key events and individuals relevant to frame structures.  Compare the final product to the original design specification.  Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.  Consider the views of others to improve their work.  Investigate famous manufacturing and engineering companies relevant to the project. | Investigate and analyse textile products linked to their final product.  Compare the final product to the original design specification.  Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.  Consider the views of others to improve their work.  Continually evaluate and modify the working features of the product to match the initial design specification.  Test the system to demonstrate its effectiveness for the intended user and purpose. |
| **Technical Knowledge** | Explore and use sliders and levers.  Understand that different mechanisms produce different types of movement.  Know how to make freestanding structures stronger, stiffer and more stable.  Know and use technical vocabulary relevant to the project. | Explore and use wheels, axles and axle holders.  Distinguish between fixed and freely moving axles.  Know and use technical vocabulary relevant to the project.  Understand how simple 3-D textile products are made, using a template to create two identical shapes.  Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.  Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.  Know and use technical vocabulary relevant to the project. | Develop and use knowledge of how to construct strong, stiff shell structures.  Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.  Know and use technical vocabulary relevant to the project.  Understand and use lever and linkage mechanisms.  Distinguish between fixed and loose pivots. | Know how to strengthen, stiffen and reinforce existing fabrics.  Understand how to securely join two pieces of fabric together.  Understand the need for patterns and seam allowances.  Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.  Apply their understanding of computing to program and control their products.  Know and use technical vocabulary relevant to the project. | Understand how to strengthen, stiffen and reinforce 3-D frameworks.  Know and use technical vocabulary relevant to the project.  Understand that mechanical and electrical systems have an input, process and an output.  Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. | A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.  Fabrics can be strengthened, stiffened and reinforced where appropriate.  Understand and use  electrical systems in their products.  Understand the use of  computer control systems in  products.  Apply their understanding of computing to program, monitor and control their products.  Know and use technical vocabulary relevant to the project. |

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| **Key vocabulary** | *slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards design, make, evaluate, user, purpose, ideas, design criteria, product, function*  *ut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder design, make, evaluate, user, purpose, ideas, design criteria, product, function* | *vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used design, make, evaluate, purpose, user, criteria, functional*  *names of existing products, joining and finishing techniques, tools, fabrics and components template, pattern pieces, mark out, join, decorate, finish features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function* | *shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype*  *mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function prototype, design criteria, innovative, appealing, design brief* | *fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces*  *series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device user, purpose, function, prototype, design criteria, innovative, appealing, design brief* | *frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional*  *pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams mechanical system, electrical system, input, process, output design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief* | *seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper design criteria, annotate, design decisions, 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* |

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| **Food and Nutrition** | | | |
|  | **Years 1 and Year 2** | **Years 3 and Year 4** | **Years 5 and Year 6** |
| **Design** | Design appealing products for a particular user based on simple design criteria.  Generate initial ideas and design criteria through investigating a variety of fruit and vegetables.  Communicate these ideas through talk and drawings | Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.  Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. | Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification.  Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose.  Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. |
| **Make** | Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.  Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. | Plan the main stages of a recipe, listing ingredients, utensils and equipment.  Select and use appropriate utensils and equipment to prepare and combine ingredients.  Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. | Write a step-by-step recipe, including a list of ingredients, equipment and utensils  .  Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.  Make, decorate and present the food product appropriately for the intended user and purpose. |
| **Evaluate** | Taste and evaluate a range of fruit and vegetables to determine the intended user’s preferences.  Evaluate ideas and finished products against design criteria, including intended user and purpose. | Carry out sensory evaluations of a variety of ingredients and products.  Record the evaluations using e.g. tables and simple graphs.  Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. | Carry out sensory evaluations of a range of relevant products and ingredients.  Record the evaluations using e.g. tables/graphs/charts such as star diagrams.  Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.  Understand how key chefs have influenced eating habits to promote varied and healthy diets. |
| **Technical Knowledge** | Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.  Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell Guide.  Know and use technical and sensory vocabulary relevant to the project. | Know how to use appropriate equipment and utensils to prepare and combine food.  Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.  Know and use relevant technical and sensory vocabulary appropriately. | Know how to use utensils and equipment including heat sources to prepare and cook food.  Understand about seasonality in relation to food products and the source of different food products.  Know and use relevant technical and sensory vocabulary. |
| **Key vocabulary** | *fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria* | *name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet planning, design criteria, purpose, user, annotated sketch, sensory evaluations* | *Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble design specification, innovative, research, evaluate, design brief* |

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| **Food and Nutrition- Skills** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| * To use simple cutting tools to prepare soft fruit and vegetables * To follow simple health and safety procedures | * To use simple cutting tools to prepare soft fruit and vegetables * To follow simple health and safety procedures * To peel, chop, slice and grate foods. | * To prepare simple dishes safely and hygienically, without using a heat source * To use techniques such as cutting, peeling and grating with greater confidence and independency | * To chop a wider range of foods using different techniques i.e. claw grip, bridge grip. * To use sensory information to evaluate a variety of ingredients | * To chop a wider range of foods using different techniques i.e. claw grip, bridge grip. * To measure ingredients using weighing scales * To select a range of utensils appropriate to prepare ingredients * To use sensory information to evaluate a variety of ingredients | * To measure ingredients accurately using different units * To follow a recipe * To select appropriate utensils for specific jobs. | * To use methods for mixing ingredients i.e. rubbing in * To cut, shape and knead dough * To follow a recipe * To select appropriate utensils for specific jobs. |
| **Food and Nutrition- Knowledge** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| * To know that some food are healthier than others * To know that sugar and fat need to be limited as part of a healthy and balanced diet. | * To know technical vocabulary relevant to the project (see vocab) * To know where a range of fruit and vegetables come from. * To know the principles of a varied diet. | * To know technical vocabulary relevant to the project (see vocab) * To know how to name and sort foods into the five groups in The Eatwell Plate * To know that everyone should eat at least five portions of fruit and vegetables every day | * To know relevant health and safety procedures when handling and preparing foods * To know technical vocabulary relevant to the project (see vocab) * To know about a range of fresh and processed foods for their product * To know whether foods are grown, reared or caught | * To know relevant health and safety procedures when handling and preparing foods * To know technical vocabulary relevant to the project (see vocab) * To know about a range of fresh and processed foods for their product * To know whether foods are grown, reared or caught * To know about fair trade foods | * To know about seasonality in relation to food products | * To know about key chefs and how they have promoted seasonality, local produce and healthy eating |

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| **Mechanisms- Skills** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| To work with paper and card to make simple flaps and hinges.  To make choices about the best way to join the corners together when making a paper hat  To use scissors, glue, paper fasteners and masking tape to make simple cuts, shapes and joins  To use construction kits to build a moving vehicle | **Sliders and levers**   * To operate existing sliders and levers * To use some simple fixing techniques (i.e. masking tape to secure a lollipop stick slider) * To make simple sliders and levers | **Wheels and axels**   * To use construction kits to create a product that moves * To mark out, hold, cut and join materials and components correctly | **Levers and linkages**   * To correctly and accurately mark out, cut, join and use finishing techniques * To use lever and linkage mechanisms * To measure with accuracy when measuring, using mm rather than cm or inches) |  | **Pulleys and gears**   * To accurately draw an exploded diagram * To use construction kits to create different sized pulleys and explore the effect on speed of direction and rotation * To build a working circuit that incorporates a battery, motor and handmade switch * To accurately use tools and equipment to cut and strip wire * To produce detailed step-by-step plans * To use a range of finishing techniques |  |
| **Mechanisms- Knowledge** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| To know how to fold paper to make cards  To know that glue, paper fasteners and tape can all be used to join paper together  To know the names of items used to fasten paper | * To know that different mechanisms create different types of movement * To know the name of simple tools and their purpose * To know what a pivot is * To know technical vocabulary relevant to the project (see vocabulary above) * To know where sliders and levers are used in real life context | * To know the main components of a wheeled product * To know how wheeled components are used in daily life * To know the difference between fixed and free moving axles * To know simple methods to fix wheels and axles to a product * To know the names of some simple tools and their purpose * To know technical vocabulary relevant to the project (see vocabulary above) * To know the difference between pulling and pushing forces * To know which materials are best used for particular components (i.e. rubber covered wheels might provide more grip than plastic wheels) | * To know the difference between a fixed and loose pivot * To know technical vocabulary relevant to the project (see vocabulary above) * To know what a design brief is * To know where levers and linkages are used in commercial products or industry * To know why levers are used to lift loads |  | * To know that mechanical and electrical systems have an input, process and output * To know what a gear is * To know what a pulley is * To know that gears and pulleys can be used to speed up, slow down or change the direction of movement * To know technical vocabulary relevant to the project (see vocabulary above) * To know where pulleys and gears are used in commercial products and industry * To know what forces are acting on pulleys and gears (i.e. friction, gravity) * To know whether a gear will turn clockwise or anticlockwise |  |

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| **Structures- Skills** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| To use construction kits to build a variety of structures for a specific purpose: a way to cross the sea, a castle, an animal cage  To use basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.  To select materials appropriate to the task  .  To use simple woodwork tools safely | * To identify structures in the locality * To use technical vocabulary to label parts of the structures (wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle) * To use construction kits to build a variety of freestanding structures that exist locally * To use paper folds to create freestanding structures * To use some simple finishing techniques to complete their structure |  | * To deconstruct packages, identifying their components and net * To evaluate existing products * To construct nets with flat faces * To use scoring and cutting to assemble pre-drawn nets * To include a simple window in a structure * To use different ways of stiffening and strengthening shell structures * To use techniques to create a desired appearance |  | * To make annotated drawings of a range of portable and permanent frame structures * To use construction kits to create 2D frameworks * To compare the strength of square frames with triangular frameworks * To use diagonals to reinforce square frameworks * To accurate use tools and equipment, such as junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills * To accurately join framework materials together * To produce detailed step-by step plans * To know how to stiffen, strengthen and reinforce a range of 3-D frameworks |  |
| **Structures- Knowledge** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| To know the names of components within construction kits  To know the names of simple woodwork tools  To know how to use a range of tools safely | * To know how to make freestanding structures stronger, stiffer and more stable * To know how to join some simple materials * To know a simple order of making a structure * To know the name of simple 2D shapes * To know technical vocabulary relevant to the project (see vocab) |  | * To know what a net is * To know the names of more complex 3D shapes * To know which tools are appropriate for cutting and scoring materials * To know how to test a material’s strength * To know technical vocabulary relevant to the project (see vocab) * To know why engineers use certain structures for certain purposes |  | * To know which materials are best suited to stiffen and reinforce by selecting them due to their properties * To know which shapes are the strongest and will support the most weight in a structure * To know technical vocabulary relevant to the project) see vocab) * To know why engineers use complex structures for certain purposes * To know how engineers solve complex design problems i.e. building Burji Khalifa in Dubai   Peter Rice, Fazlur Khan) |  |

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| **Textiles- Skills** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  | * To evaluate existing products * To compare fabrics, joining techniques, finishing techniques and fastenings of existing products * To label drawings of existing products, identifying the fabrics, fastenings and techniques * To make a simple template or pattern * To use sewing techniques, such as running stitch, threading own needle stapling, lacing and gluing * To use finishing techniques, such as sewing a button, gluing sequins, 3D fabric paint and printing * To evaluate own ongoing work |  | * To disassemble textiles, exploring seams, patterns and 3D shape * To join fabrics together, including a seam allowance * To create a pattern using 2D shape * To use a range of finishing techniques e.g. applique, embroidery, printing, fabric paints/pens * To use sketches and annotated drawings to plan * To create prototypes and mock-ups * To evaluate as the process is undertaken |  | * To analyse and evaluate existing products that have been produced by combining fabric shapes * To analyse how existing products have been constructed * To thread needles and join textiles using a range of stitches, consistent in size * To sew textiles by joining the right sides together and making seams * To sew and shape curved edges * To tack, attach wadding and stiffen * To use grids or tracing paper to produce patterns * To pin patterns * To use CAD to generate pattern pieces * To produce step-by-step plans * To evaluate as they work, and evaluate the final product |
| **Textiles- Knowledge** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  | * To know why designers use templates * To know when to use certain fabrics based on their suitability to the product * To know how to use simple stitch techniques * To know the advantages and disadvantages of different sewing techniques * To know which finishing technique to use depending upon the required effect * To know how to follow relevant health and safety protocols * To know technical vocabulary relevant to the project (see vocabulary above) |  | * To know why designers might need to strengthen, stiffen and reinforce existing fabrics * To know about changes in the textile industry e.g.the invention of zips and Velcro * To know what constitutes a renewable/sustainable material/fabric * To know how to follow relevant health and safety protocols * To know technical vocabulary relevant to the project (see vocabulary above) * To know a range of designers who use fabrics in their work |  | * To know that a 3D textile product can be made from a combination of accurately made pieces * To know when to combine multiple different fabrics to create a 3D product * To know when to use particular stitch types (including finishing stitches) * To know how to follow relevant health and safety protocols * To know technical vocabulary relevant to the project (see vocabulary above) * To know how a questionnaire can help with product design * To know how to test fabrics in order to select them for use |

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| **Electrical Systems- Skills** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  |  |  | \*To disassemble battery operated products  \*To use switches in simple circuits to control bulbs and buzzers  \*To find a fault in a simple circuit  \*To make circuits using simple classroom materials  \*To produce annotated sketches, cross sectional and exploded diagrams  \*To evaluate throughout and final product against intended purpose |  | \*To use measuring, marking out, cutting and joining skills  \*To use wire strippers, twist and tape connections, screw connections, crocodile clips and connecting blocks to make electrical components secure  \*To make a simple circuit where an output can be controlled by one switch  \*To modify computer control programs that include inputs, outputs ad decision making  \*To draw on research to inform design process  \*To communicate ideas through annotated sketches and pictorial representations  \*To produce detailed step-by-step plans  \*To critically evaluate throughout and the existing product |
| **Electrical Systems - Knowledge** | | | | | | |
| **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
|  |  |  |  | \*To know how to avoid making short circuits  \*To know the dangers of mains electricity  \*To know how electricity is measured (volts and amps)  \*To know a range of simple electrical components and their functions, such as a bulb, buzzer and switch  \*To know how to control and program a product using computing  \*To know some simple conductors and insulators  \*To know a range of places electrical systems are used (i.e. lighting in a house, display signs, traffic lights) |  | \*To know how to incorporate simple self-made switches in a circuit  \*To know how to test components in more complex circuits (series and parallel) \*To know how simple switches can be made  \*To know how to assess faults in their own electrical systems  \*To know how to test components in a simple series circuit  \*To know why materials make good conductors and insulators  \*To know how electrical systems are controlled (i.e. flow charts)  \*To know technical vocabulary relevant to the project (see vocabulary above)  \*To know about famous inventors and their work e.g. Thomas Edison |