Design and Technology

Progression of conceptual knowledge and skills:

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| **Design and Technology:** |
| **EYFS** |
| **Foundation 1**  **Personal development- Gross motor skills**  Showing some control over their body.  Showing some control over their choice of tools.  Showing increasing development of control over trickier tools, e.g. a flag, a spade.  Starting to control the body to work with others.  Good control in large movements like changing direction when running.  Beginning to control smaller tools.  **Personal development- Fine motor skills**  Will use a range of tools and equipment.  Will use a range of tools and equipment with some control.  Starts to recognise the changes they can make using tools and equipment.  Showing more fine motor control with tools.  Showing finer control with smaller tools whilst still needing some help with tricky things like buttons.  Being more in control of the tools being used, e.g. can make more controlled marks with 9 crayons and pencils.  **Expressive Arts- Creating with materials**  Shows an interest in making marks and controlling the tools and equipment needed to manipulate marks on the paper.  Experimentation of marks and mark making using colour, texture and senses.  More-deliberate use of materials and colour with more-deliberate exploration of colour and changes.  **Foundation 2**  **Physical development- Fine motor skills**  Begins to make marks and shapes using simple equipment.  Uses a wider range of equipment to make more refined shapes and marks, models and construction.  Adds more detail to shapes and objects created as control increases.  Shows increased control to use a range of tools to create more complex shapes, objects and writing.  ELG: • Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases.  • Use a range of small tools, including scissors, paintbrushes and cutlery.  • Begin to show accuracy and care when drawing.  **Expressive art- Creating with materials**  Beginning to understand colour, shape and space.  Knows how to put things together in a basic way.  Pupils’ creations are more clearly representational and outcomes have a more easily identifiable purpose.  Explore different materials freely.  Develop their own ideas and then decide which materials to use to express them.  Join different materials and explore different textures.  ELG: Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.  **Understanding the world**  Explore how things work  Talk about differences between materials and changes they notice.  ELG: • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. |

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| **Design and technology: Progression of knowledge, skills and understanding** | | | | |
| **Key Stage 1** | | | | |
| **Developing, Planning and communicating ideas** | **Year 1** | | **Year 2** | |
| *Design purposeful,functional,appealing products for themselves and other users based on design criteria*  *Generate,develop, model and communicate their ideas through talking, drawing, templates, mock ups and where appropriate information and communication technology* | **Knowledge**  ***Context, user and purpose-***   * Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, local community, industry, and the wider environment. * State what products they are designing and making. * Describe what their products are for. * Say how their product will work.   ***Generating, developing and communicating ideas-***   * Use simple design criteria to help develop their ideas. * Use knowledge of existing products to help come up with ideas. * Develop and communicate ideas by drawing and talking. * Model ideas by exploring materials, construction kits and by making templates and mock ups.   *Can they think of some ideas of their own?*  *Can they explain what they want to do?*  *Can they use pictures and words to plan?* | | **Knowledge**  ***Context, user and purpose-***   * Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, local community, industry, and the wider environment. * State what products they are designing and making. * Describe what their products are for. * Say how their product will work.   ***Generating, developing and communicating ideas-***   * Use simple design criteria to help develop their ideas. * Use knowledge of existing products to help come up with ideas. * Develop and communicate ideas by drawing and talking. * Model ideas by exploring materials, construction kits and by making templates and mock ups.   *Can they think of ideas and plan what to do next?*  *Can they choose the best tools and materials? Can they give a reason why these are best?*  *Can they describe their design by using pictures, diagrams, models and words?* | |
| **Skills**   * Draw on their own experience to help generate ideas * Suggest ideas and explain what they are going to do * Identify a target group for what they intend to design and make * Model their ideas in card and paper * Develop their design ideas applying findings from their earlier research | | **Skills**   * Generate ideas by drawing on their own and other people's experiences * Develop their design ideas through discussion, observation , drawing and modelling * Identify a purpose for what they intend to design and make * Identify simple design criteria * Make simple drawings and label parts | |
| **Working with tools, equipment, materials and components to make quality products- Planning and practical skills** | **Year 1** | | **Year 2** | |
| Select from and use a range of tools and equipment to perform practical tasks for example; cutting, shaping, joining and finishing. | **Knowledge**  **Know how things are made stronger, stiffer and more stable** | | **Knowledge**  **Know how levers, sliders, wheels and axles work** | |
| **Skills**   * Make their design using appropriate techniques * With help measure, mark out, cut and shape a range of materials * Use tools *eg scissors and a hole punch* safely * Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape * Use simple finishing techniques to improve the appearance of   their product | | **Skills**   * Begin to select tools and materials; use vocab' to name and describe them * Measure, cut and score with some accuracy * Use hand tools safely and appropriately * Assemble, join and combine materials in order to make a product * Cut, shape and join fabric to make a simple garment. * Use basic sewing techniques * Choose and use appropriate finishing techniques | |
| **Evaluating processes and products** | **Year 1** | | **Year 2** | |
| Explore and evaluate a range of existing products  Evaluate their ideas and products against design criteria | **Knowledge**   * talk about their design ideas and what they are making * make simple judgements about their products and ideas against design criteria * what products are * who products are for * what products are for * how products work * how products are used * where products might be used * what materials products are made from   what they like and dislike about products  *Can they describe how something works?*  *Can they talk about their own work and things that other people have done?* | | **Knowledge**   * talk about their design ideas and what they are making * make simple judgements about their products and ideas against design criteria * what products are * who products are for * what products are for * how products work * how products are used * where products might be used * what materials products are made from   what they like and dislike about products  *What went well with their work?*  *If they did it again, what would they want to improve?* | |  |
| **Skills**   * Evaluate their product by discussing how well it works in relation to the purpose * Evaluate their products as they are developed, identifying strengths and possible changes they might make * Evaluate their product by asking questions about what they have made and how they have gone about it | | **Skills**   * Evaluate against their design   criteria   * Evaluate their products as they are developed, identifying strengths and possible changes they might make * Talk about their ideas, saying what they like and dislike about them | |
| **Cooking and Nutrition** | **Year 1** | | **Year 2** | |
| Use the basic principles of a healthy and varied diet to prepare dishes  Understand where food comes from | **Knowledge**   * that all food comes from plants or animals * that food has to be farmed, grown elsewhere (e.g. home) or caught * to know why we need 5 portions of fruit and vegetables a day | | **Knowledge**   * that all food comes from plants or animals * that food has to be farmed, grown elsewhere (e.g. home) or caught * to understand the importance of a balanced diet. | |
| **Skills**   * Use basic skills to prepare simple dishes that do not require a heat source * Select and use appropriate fruit and vegetables, processes and tools * Use basic food handling, hygienic practices and personal hygiene * Prepare simple dishes safely and hygienically, without using a heat source * use techniques such as cutting, peeling and grating | | **Skills**   * Follow safe procedures for food safety and hygiene * Use basic skills to prepare simple dishes that do not require a heat source * Select and use appropriate fruit and vegetables, processes and tools * Use basic food handling, hygienic practices and personal hygiene * Prepare simple dishes safely and hygienically, without using a heat source * use techniques such as cutting, peeling and grating | |
| **By the end of Key Stage One pupils should-**  **Plan by suggesting what to do next, select from a range of tools and materials. Follow procedure for safety and hygiene.**  **Measure, mark and cut out and shape materials, assemble and join materials and use finishing techniques.** | | | | |
| **Design and Technology: Progression of knowledge, skills and understanding** | | | | |
| **Key Stage 2** | | | | |
| **Developing, Planning and communicating ideas** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| 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 | Knowledge:   * work confidently within a range of contexts, such as the home, school, leisure, culture,enterprise, industry and the wider environment * describe the purpose of their products * indicate the design features of their products that will appeal to intended users * explain how particular parts of their products work * gather information about the needs and wants of particular individuals and groups * develop their own design criteria and use these to inform their ideas   *Can they show that their design meets a range of requirements?*  *Can they put together a step-by-step plan which shows the order and also what equipment and tools they need?*  *Can they describe their design using an accurately labelled sketch and words?*  *How realistic is their plan?* | Knowledge:   * work confidently within a range of contexts, such as the home, school, leisure, culture,enterprise, industry and the wider environment * describe the purpose of their products * indicate the design features of their products that will appeal to intended users * explain how particular parts of their products work * gather information about the needs and wants of particular individuals and groups * develop their own design criteria and use these to inform their ideas   *Can they come up with at least one idea about how to create their product?*  *Do they take account of the ideas of others when designing?*  *Can they produce a plan and explain it to others?*  *Can they suggest some improvements and say what was good and not so good about their original design?* | Knowledge:   * work confidently within a range of contexts, such as the home, school, leisure, culture,enterprise, industry and the wider environment * describe the purpose of their products * indicate the design features of their products that will appeal to intended users * explain how particular parts of their products work * carry out research, using surveys, interviews, questionnaires and web-based resources * identify the needs, wants, preferences and values of particular individuals and groups * *develop a simple design specification to guide their thinking*   *Can they come up with a range of ideas after they have collected information?*  *Do they take a user’s view into account when designing?*  *Can they produce a detailed step-by-step plan?*  *Can they suggest some alternative plans and say what the good points and drawbacks are about each?* | Knowledge:   * work confidently within a range of contexts, such as the home, school, leisure, culture,enterprise, industry and the wider environment * describe the purpose of their products * indicate the design features of their products that will appeal to intended users * explain how particular parts of their products work * carry out research, using surveys, interviews, questionnaires and web-based resources * identify the needs, wants, preferences and values of particular individuals and groups * *develop a simple design specification to guide their thinking* * *Can they use a range of information to inform their design?* * *Can they use market research to inform plans?* * *Can they work within constraints?* * *Can they follow and refine their plan if necessary?* * *Can they justify their plan to someone else?* * *Do they consider culture and society in their designs?* |
| Skills:   * Generate ideas for an item, considering its purpose and   the user/s   * Identify a purpose and   Establish criteria for a successful product.   * Plan the order of their work before starting * Explore, develop and communicate design proposals by modelling ideas   Make drawings with labels when designing | Skills:   * Generate ideas, considering the purposes for which they are designing * Make labelled drawings from different views showing specific features * Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail   Evaluate products and identify criteria that can be used for their own designs | Skills:   * Generate ideas through brainstorming and identify a purpose for their product * Draw up a specification for their design * Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting   alternative methods of making  if the first attempts fail   * Use results of investigations, information sources, including ICT when developing design   ideas | Skills:   * Communicate their ideas through detailed labelled drawings * Develop a design   specification   * Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways   Plan the order of their work, choosing appropriate materials, tools and techniques |

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| **Working with tools, equipment, materials and components to make quality products- Planning and practical skills** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| 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. | Knowledge:   * How to use learning from science to help design and make products that work. * How to use learning from mathematics to help design and make products that work. * That materials have both functional and aesthetic properties/qualities.   That mechanical and electrical systems have an input, process and output.  *How can levers and linkages create movement?*  *How can simple electrical circuits create functional products? (Year 4)*  *How can we program a computer to control a product? (Year 4)*  *How can we make a product strong, stiff and stable?* | | Knowledge:   * How to use learning from science to help design and make products that work. * How to use learning from mathematics to help design and make products that work. * That materials have both functional and aesthetic properties/qualities.   That mechanical and electrical systems have an input, process and output and electrical systems have an input, process and output.  *How can cams and pulleys create movement?*  *How can more complex electrical circuits create functional products?*  *How can I program a computer to monitor changes in the environment and control their products.*  *How can I reinforce and strengthen a 3D framework?* | |
| Skills:   * Select tools and techniques for making their product * Measure, mark out, cut, score and assemble components with more accuracy * Work safely and accurately with a range of simple tools * Think about their ideas as they make progress and be willing change things if this helps them improve their work * Measure, tape or pin, cut and join fabric with some accuracy * Use finishing techniques strengthen and improve the appearance of their product using a range of equipment   including ICT | Skills:   * Select appropriate tools and techniques for making their product * Measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques * Join and combine materials and components accurately in temporary and permanent ways * Sew using a range of different stitches, weave and knit * Measure, tape or pin, cut and join fabric with some accuracy * Use simple graphical communication techniques | Skills:   * Select appropriate materials, tools and techniques * Measure and mark out accurately * Use skills in using different tools and equipment safely and accurately   Cut and join with accuracy to ensure a good-quality finish to the product | Skills:   * Select appropriate tools, materials, components and techniques * Assemble components make working models * Use tools safely and accurately * Construct products using permanent joining techniques * Make modifications as they go along * Pin, sew and stitch materials together create a product   Achieve a quality product |

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| **Evaluating processes and products** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| 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 | Knowledge:  ***Own ideas and products***   * identify the strengths and areas for development in their ideas and products• consider the views of others, including intended users, to improve their work * refer to their design criteria as they design and make * use their design criteria to evaluate their completed products   ***Existing products***  investigate and analyse:   * who designed and made the products * where products were designed and made * when products were designed and made * whether products can be recycled or reused   ***Key events and individuals***  Across KS2 pupils should know:  • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products  *What did they change which made their design even better?* | Knowledge:  ***Own ideas and products***   * identify the strengths and areas for development in their ideas and products• consider the views of others, including intended users, to improve their work * refer to their design criteria as they design and make * use their design criteria to evaluate their completed products   ***Existing products***  investigate and analyse:   * who designed and made the products * where products were designed and made * when products were designed and made * whether products can be recycled or reused   ***Key events and individuals***  Across KS2 pupils should know:  • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products  *Have they thought of how they will check if their design is successful?*  *Can they begin to explain how they can improve their original design?*  *Can they evaluate their product, thinking of both appearance and the way it works?* | Knowledge:  ***Own ideas and products***   * identify the strengths and areas for development in their ideas and products• consider the views of others, including intended users, to improve their work * critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make   *evaluate their ideas and products against their original design specification*  ***Existing products***  *Investigate and analyise:*   * how much products cost to make * how innovative products are * how sustainable the materials in products are   what impact products have beyond their intended purpose  ***Key events and individuals***  Across KS2 pupils should know:  • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products  *Do they keep checking that their design is the best it can be?*  *Do they check whether anything could be improved?*  *Can they evaluate appearance and function against the original criteria?* | Knowledge:  ***Own ideas and products***   * identify the strengths and areas for development in their ideas and products• consider the views of others, including intended users, to improve their work * critically evaluate the quality of the design, manufacture and fitness for purpose of theirproducts as they design and make   *evaluate their ideas and products against their original design specification*  ***Existing products***  *Investigate and analyise:*   * how much products cost to make * how innovative products are * how sustainable the materials in products are   what impact products have beyond their intended purpose  ***Key events and individuals***  Across KS2 pupils should know:  • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products  *How well do they test and evaluate their final product?*  *Is it fit for purpose?*  *What would improve it?*  *Would different resources have improved their product?*  *Would they need more or different information to make it even better?* |
| Skills:   * Evaluate their product against original design criteria *e.g. how well it meets its intended purpose* * Disassemble and evaluate familiar products | Skills:   * Evaluate their work both during and at the end of the   assignment  Evaluate their products carrying out appropriate tests | Skills:   * Evaluate a product against the original design specification * Evaluate it personally and seek evaluation from others | Skills:   * Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests * Record their evaluations using drawings with labels * Evaluate against their original criteria and suggest ways that their product could be   improved |

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| **Cooking and Nutrition** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| To understand and apply the principles of a healthy and varied diet , understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. | Knowledge:   * that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world   *Can they choose the right ingredients for a product?*  *Can they use equipment safely?*  *Can they make sure that their product looks attractive?*  *Can they describe how their combined ingredients come together?* | Knowledge:   * that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world   *Can they set out to grow plants such as cress and herbs from seed with the intention of using them for their food product?*  *Do they know what to do to be hygienic and safe?* | Knowledge:   * that seasons may affect the food available * how food is processed into ingredients that can be eaten or used in cooking   *Can they describe what they do to be both hygienic and safe?*  *How have they presented their product well?* | Knowledge:   * that seasons may affect the food available * how food is processed into ingredients that can be eaten or used in cooking   *Can they explain how their product should be stored with reasons?*  *Can they set out to grow their own products with a view to making a salad, taking account of time required to grow different foods?* |
| Skills:   * that a healthy diet is made up from a variety and balance of different food and drink, as described in The eat well plate * that to be active and healthy, food and drink are needed to provide energy for the body * Demonstrate hygienic food preparation and storage | Skills:   * that a healthy diet is made up from a variety and balance of different food and drink, as described in The eat well plate * that to be active and healthy, food and drink are needed to provide energy for the body * Demonstrate hygienic food preparation and storage | Skills:   * *that recipes can be adapted to change the appearance, taste, texture and aroma* * that different food and drink contain different substances – nutrients, water and fibre – that are needed for health * Demonstrate hygienic food preparation and storage * Weigh and measure   Accurately (time,dry ingredients, liquids)   * Apply the rules for basic food hygiene and other safe practices *e.g. hazards relating to the use of ovens* | Skills:   * *that recipes can be adapted to change the appearance, taste, texture and aroma* * that different food and drink contain different substances – nutrients, water and fibre – that are needed for health * Demonstrate hygienic food preparation and storage * Weigh and measure   accurately (time, dry ingredients, liquids)   * Apply the rules for basic food hygiene and other safe practices *e.g. hazards relating to the use of ovens* |
| **By the end of Key Stage Two pupils should-**  **Formulate lists of resources and step-by-step plans, select suitable tools, equipment, materials and explain their choices.**  **Follow procedures for health and safety, use a wider range of materials, measure, mark, cut out, shape, assemble, join, combine and finish with accuracy.** | | | | |

Design and Technology

Progression of Vocabulary:

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|  | *Designing, making and evaluating* | *Cooking and nutrition* | *Structures* | *Textiles* | *Mechanisms* | *Electrical systems* |
| **Across Key Stage One** | investigating, planning, design, make, evaluate, user, purpose, ideas, design criteria, product, function | 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 | cut, 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 | joining and finishing techniques, tools, fabrics and components, template, pattern pieces, mark out, join, decorate, finish | slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards |  |
| **Across Key Stage Two** | function, innovative, design specification, design brief, user, purpose design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional, mock-up, prototype | 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 | 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, | 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, | 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 | Toggle/reed switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, |