 Design and Technology

 Coverage and Progression Document

 Grange Primary School

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**D&T Level Expected at the End of EYFS**

**During the Early Years Foundation Stage, the essential building blocks of children’s design and technology capability are established. There are many opportunities for carrying out D&T-related activities across all areas of learning.**

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| **By the end of the reception year most children should be able to:** |
| Construct with a purpose in mind, using a variety of resources. | Build and construct with a wide range of objects, selecting appropriate resources and adapting their work when necessary. |
| Use simple tools and techniques competently and appropriately. | Select the tools and techniques they need to shape, assemble and join materials they are using. |

**D&T-related activities in the EYFS should be appropriate to the developmental stage of the children. Activities should look quite different from those carried out in KS1.**

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|  **Effective practice in the EYFS has the following characteristics:** |
| Designing does not necessarily entail drawing  | Designing is usually intuitive |
| Designing can mean using hand gestures, arranging and re-arranging materials and components, talking and listening  | Designing can mean using hand gestures, arranging and re-arranging materials and components, talking and listening  |
| Designing is usually intuitive  | Sometimes practical skills are taught directly |
| The designing and making process is fluid  | The designing and making process is fluid  |
| Sometimes practical skills are taught directly  |  |

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| **Design and Technology activities in Reception should include** |
| Construction | Learning to construct with a purpose in mind, e.g. using scissors, glue, string and a hole-punch to make a bag to store items collected during a Forest School session |
| Structure and Joins | Observing closely and replicating a structure, e.g. following a visit, children make a milking shed, church tower out of small wooden bricks |
| Using a Range of Tools | Learning about planning and adapting initial ideas to make them better, e.g. a child might choose to use scissors, a stapler, elastic bands and glue to join bits together to make a toy vehicle. But they might then modify their initial idea by using masking tape. Children should use a range of tools including scissors, hole punch, stapler, glue spreader, rolling pin, cutter and grater |
| Cooking | Beginning to understand some of the tools, techniques and processes involved in food preparation. E.g. taking turns stirring the mixture for a cake and then watching it rise while cooking. Children should practise stirring, mixing, pouring and blending ingredients during cookery activities |
| Exploration | Learning about how everyday objects work by dismantling things and looking closely at their component parts, e.g. a child might dismantle a pepper grinder and discover how it is put together and the materials different parts are made from. |
| Discussion | Opportunities to discuss reasons that make activities safe or unsafe e.g. hygiene and electrical awareness. Opportunities to discuss appropriate use of senses e.g. when tasting different foods. Opportunities to use the language of designing and making, e.g. words such as ‘join', ‘build' and ‘shape' as well as evaluative and comparative language - ‘longer', ‘shorter', ‘lighter', ‘heavier' and ‘stronger'. Children should also learn to record their experiences by, for example, drawing, writing, voice recording or modelling |

**D&T 6 Essentials Progression Framework KS1&2**

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| The 6 Essentials identifies the fundamental skills that our learners should gain from Design & Technology sessions. |
|  | **KS1** | **KS2** |
| **User** | ***Pupils should have a clear idea of who they are designing and making products for, considering their wants, needs, values, interests and preferences. The intended user could be themselves, or others, an imaginary or story-based character, a client, a consumer or a specific target group*** |
| ***The pupils can:**** Identify who their products will be for.
* Suggest possible users of a range of existing products.
* Explore how existing products are used.
* Consider where and when their own and others’ products might be used.
* Evaluate whether users’ needs and preferences have been met effectively.
* Appreciate the importance of the user within D&T
 | *The pupils can:** Explore users’ needs in a range of contexts
* Research to identify potential problems and opportunities for users
* Analyse findings and draw conclusions from their research
* Distinguish between needs, wants, values, interests and preferences.
* Design products for individuals, clients, consumers and target groups.
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| **Purpose** | ***Pupils should be able to clearly communicate the purpose of their products they are designing and making. Each product should be designed to perform one or more defined tasks.*** |
| ***The pupils can:**** State what their products are for
* Suggest the purpose of a range of existing products
* Develop design criteria that take account of the intended purpose of their products.
 | ***The pupils can:**** Clarify the purpose of the products they are designing and making
* Evaluate how well existing products meet their intended purpose
* Understand the concept of ‘fitness for purpose’ in the context of their own designing and making
* Distinguish between how well products are designed and how well they are made
* Discuss whether their own and existing products have an impact beyond their intended purpose
* Recognise when products have to fulfil conflicting requirements.
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| **Functionality** | ***Pupils should design and make products that work effectively in order to fulfil users’ needs, wants and purposes.*** |
| ***The pupils can:**** Know that their products should work in some way
* Know how a range of existing products work
* Develop specific technical knowledge and understanding, in order to ensure that their products work well.
 | ***The pupils can:**** Understand the meaning of ‘functionality’ and its importance to design and technology
* Know how functionality is relevant to the product they are designing
* Know how the materials and components they use assist the functionality of the product
* Contrast the functional properties of materials and components with their aesthetics qualities
* Understand that how products work affects how they are used
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| **Design** | ***Pupils need opportunities to make their own design decisions. Through making design decisions pupils decide on the form their product will take, how their product will work, what task it will perform and who the product will be for. This demonstrates their creative, technical and practical expertise.*** |
| ***The pupils can:**** Make their own design decisions
* Discuss the design decisions that have been made in existing products
* Take into account users’ needs when making design decisions
* Develop their technical and practical expertise in order that they can make informed design decisions
* Use D&T related visits and inputs from experts to make informed design decisions
 | ***The pupils can:**** Discuss the effectiveness of the design decisions made in existing products
* Discuss the effectiveness of the design decisions made in their own products
* Identify, describe, and offer reasons for the presence of pollution on a beach.
* Describe and explain how people can take greater care of the seaside environment.
* Describe what a *habitat* is and the features of one kind of seaside habitat.
* Understand the interdependence of living things in seaside environments.
* Identify different places at the seaside where plants, birds and animals might live.
* Describe and compare how people have enjoyed holidays at the seaside in the past compared with today.
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| **Innovation** | ***When designing and making, pupils need some scope to be original with their thinking. Projects that encourage innovation lead to a range of design ideas and products being developed. It helps to have open-ended starting points*** |
| ***The pupils can:**** Respond creatively and imaginatively to design briefs and problems
 | ***The pupils can:**** Demonstrate some originality when design and making
* Learn how to take creative risks
* Understand the meaning of ‘innovation’ within D&T
* Understand how innovation is an important part of the process of designing and making products
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| **Authenticity** | ***Pupils should design and make products that are believable, real and meaningful to themselves and others.***  |
| ***The pupils can:**** Carry out projects that are real and meaningful to them and others.
* Work within a range of relevant contexts, ranging from domestic to industrial.
* Work towards realistic and credible outcomes that can be evaluated in use.
* Engage in activity that mirrors design and technology in the wider world.
* Create products with a genuine purpose and for a real user.
* Create products which need to work in some way in order to be successful.
 | ***The pupils can:**** Understand the difference between genuine D&T products and outcomes created in other areas of the curriculum
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**D&T National Curriculum Expectations for KS1 & KS2**

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| The National Curriculum areas demonstrate how we enable our pupils to fulfil the 6 essentials. |
| **Area of Study**  | **KS1** | **KS2** |
| **DESIGNING** | Understanding contexts, users and purposes | ***Across KS1 pupils should:**** Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.
* State what products they are designing and making
* Say whether their products are for themselves or other users
* Describe what their products are for
* Say how their products will work
* Say how they will make their products suitable for their intended users
* Use simple design criteria to help develop their ideas
 | ***Across KS2 pupils should:*** * 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
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| ***In early KS2 pupils should also:*** * Gather information about the needs and wants of particular individuals and groups
* Develop their own design criteria and use these to inform their ideas
 | ***In late KS2 pupils should also:**** Analyse findings and draw conclusions from their research
* Distinguish between needs, wants, values, interests and preferences.
* Design products for individuals, clients, consumers and target groups.
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| Generating, developing, modelling and communicating ideas | ***Across KS1 pupils should:*** * Generate ideas by drawing on their own experiences
* Use knowledge of existing products to help come up with ideas
* Develop and communicate ideas by talking and drawing
* Model ideas by exploring materials, components and construction kits and by making templates and mockups
* Use information and communication technology, where appropriate, to develop and communicate their ideas
 | ***Across KS2 pupils should:*** * Share and clarify ideas through discussion
* Model their ideas using prototypes and pattern pieces
* Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas
* Use computer-aided design to develop and communicate their ideas
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| ***In early KS2 pupils should also:**** Generate realistic ideas, focusing on the needs of the user
* Make design decisions that take account of the availability of resources
 | ***In late KS2 pupils should also:*** * + Generate innovative ideas, drawing on research
	+ Make design decisions, taking account of constraints such as time, resources and cost
 |
| **MAKING** | Planning | ***Across KS1 pupils should:**** Plan by suggesting what to do next
* Select from a range of tools and equipment, explaining their choices
* Select from a range of materials and components according to their characteristics
 | **Across KS2 pupils should:*** Select tools and equipment suitable for the task
* Explain their choice of tools and equipment in relation to the skills and techniques they will be using
* Select materials and components suitable for the task
* Explain their choice of materials and components according to functional properties and aesthetic qualities
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| ***In early KS2 pupils should also:**** Order the main stages of making
 | ***In late KS2 pupils should also:**** Produce appropriate lists of tools, equipment and materials that they need
* Formulate step-by-step plans as a guide to making
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| Practical Skills and techniques | ***Across KS1 pupils should:**** Follow procedures for safety and hygiene
* Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components
* Measure, mark out, cut and shape materials and components
* Assemble, join and combine materials and components
* Use finishing techniques, including those from art and design
 | ***Across KS2 pupils should:**** Select tools and equipment suitable for the task
* Explain their choice of tools and equipment in relation to the skills and techniques they will be using
* Select materials and components suitable for the task
* Explain their choice of materials and components according to functional properties and aesthetic qualities
 |
| ***In early KS2 pupils should also:**** Order the main stages of making
 | ***In late KS2 pupils should also:**** Produce appropriate lists of tools, equipment and materials that they need
* Formulate step-by-step plans as a guide to making
 |
| **EVALUATING** | Own Ideas and products | ***Across KS1 pupils should:**** Talk about their design ideas and what they are making
* Make simple judgements about their products and ideas against design criteria
* Suggest how their products could be improved
 | ***Across KS2 pupils should:**** Identify the strengths and areas for development in their ideas and products
* Consider the views of others, including intended users, to improve their work
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| ***In early KS2 pupils should also:**** Refer to their design criteria as they design and make
* Use their design criteria to evaluate their completed products
 | ***In late KS2 pupils should also:*** * 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
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| Existing products | ***Across KS1 pupils should explore:**** 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
 | ***Across KS2 pupils should investigate and analyse:**** How well products have been designed
* How well products have been made
* Why materials have been chosen
* What methods of construction have been used
* How well products work
* How well products achieve their purposes
* How well products meet user needs and wants
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| ***In early KS2 pupils should also 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
 | ***In late KS2 pupils should also investigate and analyse:**** 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
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| Key events and Individuals |  | ***Across KS2 pupils should:**** Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
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| **TECHNICAL KNOWLEDGE** | Making Products Work | ***Across KS1 pupils should know:**** About the simple working characteristics of materials and components
* About the movement of simple mechanisms such as levers, sliders, wheels and axles
* How freestanding structures can be made stronger, stiffer and more stable
* That a 3-D textiles product can be assembled from two identical fabric shapes
* That food ingredients should be combined according to their sensory characteristics
* The correct technical vocabulary for the projects they are undertaking
 | ***Across KS2 pupils should know:**** 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 properties and aesthetic qualities
* That materials can be combined and mixed to create more useful characteristics
* That mechanical and electrical systems have an input, process and output
* The correct technical vocabulary for the projects they are undertaking
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| ***In early KS2 pupils should also know:**** How mechanical systems such as levers and linkages or pneumatic systems create movement
* How simple electrical circuits and components can be used to create functional products
* How to program a computer to control their products
* How to make strong, stiff shell structures
* That a single fabric shape can be used to make a 3D textiles product
* That food ingredients can be fresh, pre-cooked and processed
 | ***In late KS2 pupils should also know:**** How mechanical systems such as cams or pulleys or gears create movement
* How more complex electrical circuits and components can be used to create functional products
* How to program a computer to monitor changes in the environment and control their products
* How to reinforce and strengthen a 3D framework
* That a 3D textiles product can be made from a combination of fabric shapes
* That a recipe can be adapted by adding or substituting one or more ingredients
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| **COOKING AND NUTRITION** | Where food comes from | ***Across KS1 pupils should know:**** That all food comes from plants or animals
* That food has to be farmed, grown elsewhere (e.g.home) or caught
 | ***Across KS2 pupils should know:**** That a recipe can be adapted a by adding or substituting one or more ingredients
* 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
 | ***In late KS2 pupils should also know:**** That seasons may affect the food available
* How food is processed into ingredients that can be eaten or used in cooking
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| Food preparation, cooking and nutrition | ***Across KS1 pupils should know:**** How to name and sort foods into the five groups in ‘The eatwell plate’
* That everyone should eat at least five portions of fruit and vegetables every day
* How to prepare simple dishes safely and hygienically, without using a heat source
* How to use techniques such as cutting, peeling and grating
 | ***Across KS2 pupils should know:**** How to prepare and cook a variety of predominantly savoury dishes safely and hygienically [including, where appropriate, the use of a heat source]
* How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking
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| ***In early KS2 pupils should also know:**** That a healthy diet is made up from a variety and balance of different food and drink, as depicted in ‘The eatwell plate’.
* That to be active and healthy, food and drink are needed to provide energy for the body
 | ***In late KS2 pupils should also know:**** 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
 |