**Design Technology Curriculum**

**Purpose of study**

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

**Aims**

The national curriculum for design and technology aims to ensure that all pupils:

 develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world

 build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users

 critique, evaluate and test their ideas and products and the work of others

 understand and apply the principles of nutrition and learn how to cook.

**Attainment targets**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

**Key stage 1**

Pupils should be taught:

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, such as the home and school, gardens and playgrounds, the local community, industry and the wider environment.

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| **YEAR 1: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | think of some ideas of your own |  |  |  |
| **D2** | use pictures and words to plan |  |  |  |
| **D3** | explain what you are making |  |  |  |
| **D4** | explain which tools you are using |  |  |  |
| **D5** | describe how something works |  |  |  |
| **Make** - **Select from and use a range of tools and equipment to perform practical tasks such as cutting, shaping, joining and finishing. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics**  |
| **D11** | describe textiles and glue them together |  |  |  |
| **D12** | make a product that moves |  |  |  |
| **D13** | cut materials using scissors |  |  |  |
| **D14** | select the appropriate resources and tools for building projects |  |  |  |
| **D15** | say why you have chosen those moving parts |  |  |  |
| **Evaluate their ideas and products against design criteria. Explore and evaluate a range of existing products.** |
| **D16** | make a model stronger if needs be |  |  |  |
| **D17** | say whether your model fits the criteria needed |  |  |  |
| **D18** | decide whether or not to improve (with help) |  |  |  |
| **D19** |  test a model to make sure it fits the criteria |  |  |  |
| **Technical Knowledge - Build structures, exploring how they can be made stronger, stiffer and more stable** **Explore and use mechanisms, such as levers, sliders, wheels and axles, in their products.**  |
| **D20** | fInd out how to make materials for their structure stronger by folding, joining or rolling |  |  |  |
| **D21** | explore how moving objects work |  |  |  |
| **D22** | look at wheels, axels, turning mechanisms, hinges and simple levers |  |  |  |
| **D23** | know how textiles can be used to make products |  |  |  |
| **D24** | alter a textile to make it stronger |  |  |  |
| **Cooking and Nutrition** |
| **D26** | use knives safely to cut food (with help) |  |  |  |
| **D27** | use a mixing bowl to prepare a mixture |  |  |  |
| **D28** | make a food product |  |  |  |
| **D29** | know that they have to wash their hands and keep work surfaces clean when preparing food |  |  |  |
| **D30** | describe the texture of foods |  |  |  |
| **D32** | think of interesting way to decorate food |  |  |  |
| **D32** | say where food comes from |  |  |  |

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| **YEAR 2: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | think of ideas and plan what to do next |  |  |  |
| **D2** | choose the best tools and materials? Can you give a reason why these are best |  |  |  |
| **D3** | describe your design by using pictures, diagrams, models and words |  |  |  |
| **Make** - **Select from and use a range of tools and equipment to perform practical tasks such as cutting, shaping, joining and finishing. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics**  |
| **D4** | join things (materials/ components) together in different ways |  |  |  |
| **D5** | describe textiles and glue them together |  |  |  |
| **D6** | make a product that moves |  |  |  |
| **D7** | cut materials using scissors |  |  |  |
| **D8** | select the appropriate resources and tools for building projects |  |  |  |
| **D9** | say why you have chosen those moving parts |  |  |  |
| **Evaluate their ideas and products against design criteria. Explore and evaluate a range of existing products.** |
| **D10** | explain what went well |  |  |  |
| **D11** | If you did it again, explain what you would improve |  |  |  |
| **Technical Knowledge (Revision of Y1 technical knowledge)** |
| **D12** | find out how to make materials for their structure stronger by folding, joining or rolling |  |  |  |
| **D13** | explore how moving objects work |  |  |  |
| **D14** | look at wheels, axels, turning mechanisms, hinges and simple levers |  |  |  |
| **D15** | know how textiles can be used to make products |  |  |  |
| **D16** | alter a textile to make it stronger |  |  |  |
| **Cooking and Nutrition** |
| **D17** | use knives safely to cut food (with help) |  |  |  |
| **D18** | use a mixing bowl to prepare a mixture |  |  |  |
| **D19** | make a food product |  |  |  |
| **D20** | know that they have to wash their hands and keep work surfaces clean when preparing food |  |  |  |
| **D21** | describe the properties of the ingredients you are using |  |  |  |
| **D22** | explain what being hygienic in the kitchen means |  |  |  |

**Design Technology Curriculum**

**Purpose of study**

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**Aims**

The national curriculum for design and technology aims to ensure that all pupils:

 develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world

 build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users

 critique, evaluate and test their ideas and products and the work of others

 understand and apply the principles of nutrition and learn how to cook.

**Attainment targets**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

**Lower Key stage 2**

Pupils should be taught:

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, such as the home and school, gardens and playgrounds, the local community, industry and the wider environment.

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| **YEAR 3: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | show that your design meets a range of requirements |  |  |  |
| **D2** | put together a step by step plan which shows the order and also the equipment and tools you will need |  |  |  |
| **D3** | think of idea and plan what to do next, based on what I know about materials and components |  |  |  |
| **D4** | use models, pictures and words to describe my designs. |  |  |  |
| **D5** | select the appropriate tools, techniques and materials, explaining my choices. |  |  |  |
| **Make** - **Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.** **-Select from and use a wider range of materials and components, including construction materials, textiles & ingredients, according to their functional properties and aesthetic qualities.**  |
| **D6** | use accurate measurements in cm. |  |  |  |
| **D7** | use scissors precisely when cutting out |  |  |  |
| **D8** | join textiles using glue, staples, tying or a simple stitch |  |  |  |
| **D9** | make a textile product that has a good finish and can do the job it was made for |  |  |  |
| **D10** | make a product that uses movement. |  |  |  |
| **D11** | choose the right materials for the job and this helps my product to work well |  |  |  |
| **D12** | use a number of materials and joined them so they are strong |  |  |  |
| **D13** | Use art skills to add design or detail to my product. |  |  |  |
| **D14** | measure and mark out materials with care and use safe ways of cutting it, including using a junior hacksaw |  |  |  |
| **Evaluate -investigate and analyse a range of existing products****Evaluate their ideas and products against their own criteria and consider the views of others to improve their work.** |
| **D15** | recognise what I have done well in my work.  |  |  |  |
| **D16** | suggest things I could do in the future |  |  |  |
| Technical Knowledge |
| **D17** | know that textiles have different properties: touch, insulation, texture and waterproof  |  |  |  |
| **D18** | select the appropriate textile so that it does the job I want it to. |  |  |  |
| **D19** | know that my product needs to be made from materials that are suitable for the job. |  |  |  |
| **D20** | know how to make structures stronger by folding, joining or by shape (columns, triangles). |  |  |  |
| **D21** | learn how to best store my product for long-life and hygiene. |  |  |  |
| **Cooking and Nutrition** |
| **D22** | prepare food safely and hygienically and can describe what this means |  |  |  |
| **D23** | describe the properties of the food ingredients: taste, smell, texture, and consistency |  |  |  |
| **D24** | weigh or measure my ingredients accurately |  |  |  |
| **D25** | describe my food product using its properties |  |  |  |

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| **YEAR 4: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | Generate ideas and recognise that their designs have to meet a range of different needs |  |  |  |
| **D2** | Make realistic plans to achieve their aims |  |  |  |
| **D3** | Think ahead about the order of their work, choosing appropriate tools, equipment, materials, components and techniques |  |  |  |
| **D4** | Clarify their ideas using labelled sketches and models to communicate the details of their designs |  |  |  |
| **Make** - **Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.** **-Select from and use a wider range of materials and components, including construction materials, textiles & ingredients, according to their functional properties and aesthetic qualities.**  |
| **D5** | select the most appropriate techniques and tools to make my product |  |  |  |
| **D6** | come up with solutions to problems as they happen |  |  |  |
| **D7** | make a product that uses both electrical and mechanical components |  |  |  |
| **D8** | Make a product with a good finish so that a user will find it both useful and attractive |  |  |  |
| **D9** | use the most appropriate mouldable material suitable for the purpose of my product |  |  |  |
| **D10** | use my art skills to apply texture or design to my product |  |  |  |
| **D11** | use scoring, and folding to shape materials accurately |  |  |  |
| **D12** | make cuts (scissors, snips, saw) accurately |  |  |  |
| **D13** | Be precise so that products have a high quality finish |  |  |  |
| **D14** | select the appropriate textile(s) for my product |  |  |  |
| **D15** | use sharp scissors accurately to cut textiles |  |  |  |
| **D16** | know that the texture and other properties of materials affect my choice |  |  |  |
| **D17** | make holes (punch, drill) accurately |  |  |  |
| **Evaluate their ideas and products against their own criteria and consider the views of others to improve their work.** |
| **D18** | Suggest how the product could be improved |  |  |  |
| **D19** | Suggest What was ok / wrong with the design |  |  |  |
| **D20** | Suggest how the joins could be improved |  |  |  |
| **D21** | Evaluate if the product suited/served the purpose and how |  |  |  |
| **Evaluate -investigate and analyse a range of existing products****Technical Knowledge**  |
| **D22** | know the application of mechanisms to create movement |  |  |  |
| **D23** | combine a number of components well in my product |  |  |  |
| **D24** | use simple circuits to either illuminate or create motion |  |  |  |
| **D25** | describe my food product in terms of taste, texture, flavour and relate this to the intended purpose of the food |  |  |  |
| **D26** | cook or chill to change the nature of the raw ingredient |  |  |  |
| **D27** | describe the qualities of my material and say why it will be the most suitable choice |  |  |  |
| **Cooking and Nutrition –****-Understand and apply the principles of a healthy and varied diet****-Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques****-Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.** |
| **D28** | Select ingredients for a food product |  |  |  |
| **D29** | Work in a safe and hygienic way |  |  |  |
| **D30** | Measure out ingredients by weight or quantity, using scales where appropriate |  |  |  |
| **D31** | Present food product to impress the intended user |  |  |  |

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 critique, evaluate and test their ideas and products and the work of others

 understand and apply the principles of nutrition and learn how to cook.

**Attainment targets**

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

**Upper Key stage 2**

Pupils should be taught:

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, such as the home and school, gardens and playgrounds, the local community, industry and the wider environment.

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| **YEAR 5: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | come up with a range of ideas after collecting information |  |  |  |
| **D2** | take a user’s view into account when designing |  |  |  |
| **D3** | produce a detailed step by step plan |  |  |  |
| **D4** | suggest some alternative plans and say what the good points and drawbacks are about each |  |  |  |
| **D5** | explain why your finished product will be of a good quality |  |  |  |
| **D6** | explain how it will appeal to a range of audiences |  |  |  |
| **Make** - **Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.** **-Select from and use a wider range of materials and components, including construction materials, textiles & ingredients, according to their functional properties and aesthetic qualities.**  |
| **D7** | use a range of tools expertly |  |  |  |
| **D8** | persevere through different stages of the making process |  |  |  |
| **D9** | keep checking the design so it is the best it can be |  |  |  |
| **D10** | measure using mm and then use scoring, and folding to shape materials accurately with a focus on precision |  |  |  |
| **D11** | make cuts (scissors, snips, saw) accurately and reject pieces that are not accurate and improve my technique |  |  |  |
| **D12** | make holes (punch, drill) accurately |  |  |  |
| **D13** | Be precise so that products have a high quality finish. |  |  |  |
| **D14** | use suitable, mouldable materials selected for the purpose of my product |  |  |  |
| **D15** | Make a product that is fit for purpose and improve it in response to a user’s point of view |  |  |  |
| **D16** | apply a high quality finish (e.g. using carving, paint, glaze, varnish or other finishes) |  |  |  |
| **D17** | use both my hands and other tools to mould materials into very accurate shapes that will do the intended job well |  |  |  |
| **Evaluate their ideas and products against their own criteria and consider the views of others to improve their work.** |
| **D18** | check whether anything can be improved |  |  |  |
| **D19** | evaluate appearance and function against the original criteria |  |  |  |
| **Evaluate -investigate and analyse a range of existing products / Technical Knowledge**  |
| **D22** | understand that some foods may not be eaten raw, as it is unsafe |  |  |  |
| **D23** | understand that cooking alters the flavour and texture of foods and use this knowledge in my designs |  |  |  |
| **D24** | know that my product may need further improvement as the material changes as it dries or when it is heated (e.g. kiln or oven) |  |  |  |
| **Cooking and Nutrition –****-Understand and apply the principles of a healthy and varied diet****-Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques****-Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.** |
| **D25** | Make a food product that uses a selection of ingredients to meet an identified need. (e.g.. lunchtime snack, healthy sandwich, low gluten) |  |  |  |
| **D26** | Work in a safe and hygienic way |  |  |  |
| **D27** | Prepare food that is well presented and packaged using other DT skills. |  |  |  |
| **D28** | Persuade others to take an interest in their product by using my persuasive writing skills that describe the qualities of my product |  |  |  |

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| **YEAR 6: DESIGN AND TECHNOLOGY** | **Planned / Covered** |
| **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.** | **Au** | **Sp** | **Su** |
| **D1** | use a range of information to inform your design |  |  |  |
| **D2** | use market research to inform plans |  |  |  |
| **D3** | work within constraints |  |  |  |
| **D4** | follow and refine your plan if necessary |  |  |  |
| **D5** | justify your plan to someone else |  |  |  |
| **D6** | consider culture and society in your design |  |  |  |
| **D7** | use your understanding of familiar products to help develop your own idea |  |  |  |
| **Make** - **Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately.** **-Select from and use a wider range of materials and components, including construction materials, textiles & ingredients, according to their functional properties and aesthetic qualities.**  |
| **D8** | use my science skills (resistance, batteries in series or parallel, variable resistance to dim lights or control speed) to alter the way my electrical products behave. |  |  |  |
| **D9** | products are well finished using a range of art and other finishing techniques |  |  |  |
| **D10** | use precise electrical connections |  |  |  |
| **D11** | select materials based on the final finished product’s use |  |  |  |
| **D12** | products have a high degree of precision and do the intended job well (e.g. a handle on a cup is designed to be an insulator) |  |  |  |
| **D13** | products are carefully finished to add extra appeal. This sometimes includes the addition of other materials (e.g. container for a wax candle) |  |  |  |
| **D14** | measure and select materials with cost and workability in mind.  |  |  |  |
| **D15** | make very careful and precise measurements so that joins, holes and openings are in exactly the right place |  |  |  |
| **D16** | ensure that edges are finished by sometimes adding other materials. (e.g. edging strips) |  |  |  |
| **D17** | Make a product with an awareness of commercial appeal |  |  |  |
| **D18** | experiment with a range of materials until I find the right mix of affordability, appeal and appropriateness for the job |  |  |  |
| **Evaluate their ideas and products against their own criteria and consider the views of others to improve their work.** |
| **D19** | change the way you are working if necessary |  |  |  |
| **D20** |  test and evaluate your final product well |  |  |  |
| **D21** | say if the product is fit for purpose and which different resources would have improved the product |  |  |  |
| **Evaluate -investigate and analyse a range of existing products / Technical Knowledge**  |
| **D22** | use proportions and ratio to produce recipes of my food product, scaling up and down for different quantities. |  |  |  |
| **Cooking and Nutrition –****-Understand and apply the principles of a healthy and varied diet****-Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques****-Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.** |
| **D23** | Make a food product that uses a selection of ingredients to meet an identified need. (e.g.. lunchtime snack, healthy sandwich, low gluten) |  |  |  |
| **D24** | Work in a safe and hygienic way |  |  |  |
| **D25** | Prepare food that is well presented and packaged using other DT skills |  |  |  |
| **D26** | Persuade others to take an interest in their product by using my persuasive writing skills that describe the qualities of my product |  |  |  |