What must be taught in Design Technology?

## Early years

- Use all their senses in hands-on exploration of natural materials'
- Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.
- Explore how things work.
- Explore different materials freely, in order to develop their ideas about how to use them and what to make.
- Develop their own ideas and then decide which materials to use to express them.
- Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
- Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.
- Explore, use and refine a variety of artistic effects to express their ideas and feelings.
- Choose the right resources to carry out their own plan.
- Use one-handed tools and equipment: To us scissors to make small cuts in materials such as paper
- Join different materials and explore different textures.
- Operate mechanical toy e.g. turns knob on a wind up toy or pulls back friction car.
- To use and explore various construction materials e.g. construction blocks, stickle bricks, Lego, junk modelling
- Use large-muscle movements to wave flags and streamers, paint and make marks.
- Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
- Create collaboratively, sharing ideas, resources and skills.
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour.
- To use blocks and construction kits to build their own simple 'worlds' e.g. buildings.
- To use blocks and construction kits to build their own more complex 'worlds' including a variety of different places e.g. buildings and a park.
- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- Make healthy choices about food, drink, activity and tooth brushing.
- Talk about simple health eating choices for example fruit is a healthier choice than a bar of chocolate.


## Early Years Goals:

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function;
- Share their creations, explaining the process they have used
- Use a range of small tools, including scissors, paintbrushes and cutlery.
- Manage their own basic hygiene and personal needs including...understanding the importance of healthy food choices.


## When designing and making, pupils should be taught to:

Design
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

## Make

Select from and use a range of tools and equipment to perform practical tasks [for example, 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

## Evaluate

Explore and evaluate a range of existing products
Evaluate their ideas and products against design criteria

## Technical knowledge

Build structures, exploring how they can be made stronger, stiffer and more stable
Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products

## KS2 NC requirements:

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 [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:
Design
use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

## Make

select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

## Evaluate

investigate and analyse a range of existing products
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Understand how key events and individuals in design and technology have helped shape the world

## Technical knowledge

Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
Apply their understanding of computing to program, monitor and control their products.

| Skills | Early Years | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Developing, planning and communicating ideas | Nursery <br> 'Use all their senses in hands-on exploration of natural materials' <br> Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them. <br> Explore how things work. <br> Explore different materials freely, in order to develop their ideas about how to use them and what to make. <br> Develop their own ideas and then decide which materials to use to express them. <br> Create closed shapes with continuous lines, and begin to use these shapes to represent objects. <br> Reception | Begin to draw on their own experience of existing products to help generate ideas. <br> Begin to understand the development of existing products: What they are for, how they work, materials used. <br> Start to suggest ideas and explain what they are going to do. <br> Understand how to identify a target group for what they intend to design and make based on a design criteria. <br> Begin to develop their ideas through talk and drawings. <br> Make templates and mock ups of their ideas in card and paper or using ICT following a design criteria. <br> To be able to follow a simple design criteria | Start to generate own ideas by drawing on their own and other people's experiences of existing products and from the world around them. <br> Identify a purpose and a user for what they intend to design and make. <br> Begin to develop their design ideas and plan what to do next through discussion, observation, drawing and modelling. <br> To plan and test ideas using templates and mock ups <br> Understand how to identify a target group for what they intend to design and make based on a design criteria. <br> Develop their ideas through talk and drawings and label parts. Make templates and mock ups of their ideas in card and paper or using ICT. | Use knowledge of a wider range of existing products to help generate design ideas. <br> With growing confidence generate ideas for an appealing item, considering its purpose and the user/s. <br> Know to make drawings/sketches with accurate annotation when designing <br> Start to order the main stages making a step by step plan which shows the order and also what equipment and tools I need in the making of a product. <br> Identify a purpose and establish a specific criteria for a successful product. <br> Understand how well products have been designed, made and what materials have been used and the construction technique. <br> Learn about inventors, designers, engineers, | Begin to use knowledge of a broad range of existing products to help generate their own design ideas. <br> To design an appealing product that has a clear purpose and aimed at a specific user <br> Use annotated and cross sectional diagrams to develop and communicate ideas. <br> Test ideas out through using prototypes <br> 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. <br> Identify the strengths and areas for development in their ideas and products. <br> Learn about inventors, designers, engineers, chefs and manufacturers who have developed | With growing confidence use knowledge of a broad range of existing products to help generate their own design ideas. <br> Design products that have a clear purpose and specific targeted user e.g. children, and begin to indicate design features of their designed product that would specifically appeal to the intended user. <br> Start to generate develop, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes to show their design. <br> Confidently develop a clear idea of what has to be done, planning step by step how to use materials, equipment and processes. <br> Suggest some alternative plans to give a range of ideas and say what the good points and drawbacks are | With confidence use knowledge of a broad range of existing products to help generate their own design ideas. <br> Design products that have a clear purpose and specific targeted user e.g. children, and with increasing confidence indicate design features of their designed product that would specifically appeal to the intended user. <br> Communicate and develop their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes, to show their design. <br> Use research to develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. <br> Draw up a specification for |





| Skills | Early Years | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Technical Knowledge | Nursery <br> To use blocks and construction kits to build their own simple 'worlds' e.g. buildings. <br> Reception <br> To use blocks and construction kits to build their own more complex 'worlds' including a variety of different places e.g. buildings and a park. | Begin to build simple structures, exploring how they can be made stronger, stiffer and more stable. <br> Explore, use and create products using mechanisms including [for example, levers, sliders in their products. | Build simple structures, exploring with more confidence how they can be made stronger, stiffer and more stable. <br> Explore, use and create products using mechanisms including levers, sliders, wheels and axles. | Begin to apply their understanding of how to strengthen and stiffen to more complex structures. <br> Start to understand and begin to use mechanical systems such as levers and linkages to create movement in their product. | Apply their understanding of how to strengthen, stiffen and reinforce to more complex structures of 3D framework. <br> To know how to explain how and use mechanical systems such as levers and linkages, gears, cams and pulleys to create movement in their product. <br> To be able to name, explain and be able to represent a simple circuit and its parts including a series and parallel circuit. <br> Make a simple electrical circuit to include a bulb within their product for a functional purpose. <br> Know how simple electrical circuits and components such as switch or a light can be used to create functional products. <br> Start to understand that mechanical and electrical systems have an input, process and output. | Apply their understanding of how to strengthen, stiffen and reinforce to more complex structures with increasing confidence. <br> Understand and explain how mechanical systems such as cams or pulleys or gears create movement. | Confidently apply their understanding to how to stiffen reinforce and strengthen complex structures including 3D framework. <br> Understand and explain in more confidence how mechanical systems such as cams or pulleys or gears create movement. <br> To be able to explain how more complex electrical circuits and components can be used to create functional products e.g. a torch. <br> Apply knowledge of computing to program and control a product. <br> Understand and be able to demonstrate and explain that mechanical and electrical systems have an input, process and output. <br> Make a product which uses both electrical and mechanical components. |


| Skills | Early Years | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Evaluating processes and products | Nursery <br> Reception <br> Return to and build on their previous learning, refining ideas and developing their ability to represent them. | Evaluate their product by discussing how well it works in relation to the purpose. <br> Evaluate their products as they are developed, identifying strengths and possible changes they might make. <br> Evaluate their product by being able to answer questions about what they have made and how they have gone about it. <br> Be able to say how existing products work. | Evaluate their work against their design criteria. <br> Look at a range of existing products explain what they like and dislike about products and why. <br> Start to evaluate their products as they are developed, identifying strengths and what went well as well as possible changes they might make. <br> With confidence talk about their ideas, saying what they like and dislike about them. <br> Start to evaluate what they would do differently if they did it again saying why. | Start to evaluate their product against original design criteria e.g. how well it meets its intended purpose - has it been successful? <br> Begin to disassemble and evaluate familiar existing products and consider the views of others to improve them. <br> Evaluate the key designs of individuals in design and technology has helped shape the world. | Be able to evaluate their product against original design criteria e.g. how well it meets its intended purpose has it been successful? <br> Evaluate their products carrying out appropriate tests. <br> Start to evaluate their work both during and at the end of the assignment to improve the original design. <br> Be able to disassemble and evaluate familiar products and consider the views of others to improve them. <br> Evaluate the key designs of individuals in design and technology has helped shape the world. | Start to evaluate a product against the original design specification and by carrying out tests. <br> Evaluate their work both during and at the end of the assignment to ensure that the design is the best it can be. <br> Begin to evaluate it personally and seek evaluation from others. <br> Evaluate the key designs of individuals in design and technology has helped shape the world. <br> Evaluate the final products appearance and functionality agains $\dagger$ original criteria. | Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. <br> Evaluate their work both during and at the end of the assignment. <br> Record their evaluations using drawings with labels. <br> Evaluate against their original criteria and suggest ways that their product could be improved. <br> Evaluate the key designs of individuals in design and technology has helped shape the world. <br> Confidently evaluate the final products appearance and functionality against original criteria. |





| Key Vocabulary | big, small, tall, high, low, build, design, model, cook, prepare, product, draw, cut, sketch, toy, mark make, tower, house, mould, clay join, measure, construct, texture, template, malleable | levers, sliders, wheels, axles, toys, turn, spin, roll, slide, move, push, pull, design, evaluation, measure, construct, template, model, food groups, protein, carbohydrates, vegetables, fruit, dairy, fats, sugars, balanced, diet, equipment, planning, two dimensional | levers, sliders, wheels, axles, toys, turn, spin, roll, slide, move, push, pull, tools, research, 2D, 3D, investigate, plan, design, Food groups, protein, carbohydrates, vegetables, fruit, dairy, fats, sugars, balanced, diet, recipe, ingredients, ingredients list, cutting, peeling, grating, lifestyle, stronger, stiffer. | glue, adhesive, design, model, evaluate, sketch, plan, patterns, cutting, shaping, malleable, diagrams, reusing, upcycling, paper mache, junk modelling, artefact, balanced, diet, recipe, ingredients, peeling, chopping, slicing, grating, mixing, spreading, kneading, baking, label, research, sew | Labelled diagram, design, balanced, diet, recipe, ingredients, peeling, chopping, slicing, grating, mixing, spreading, kneading, baking, recycling, build, girder, rafter, flexible, lever, | Aesthetics, annotated, diagram, balanced, diet, recipe, ingredients, peeling, chopping, slicing, grating, mixing, spreading, kneading, baking, recycling, scale, construct, structure, function, textile, flexible, product analysis, pneumatics, pivot, mechanism, lever, joint | Aesthetics, annotated, diagram, balanced, diet, recipe, ingredients, recycling, scale, construct, structure, function, prototype, textile, specification, functional, appealing, technique, evaluation, developing, product analysis, pivot, mechanism, lever, joint |
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| Topics/Suggested topics | Nursery <br> Traditional tales, People Who Help Us, Minibeasts <br> Christmas Cards Mothers/Fathers Day cards <br> Festivals and Celebrations Halloween baking, Diwali diva lamps. <br> Reception <br> Traditional tales, <br> Houses and homes, What a <br> Wonderful World! <br> Christmas Cards Mothers/Fathers Day cards <br> Food and Nutrition baking | Year 1 <br> Mechanisms - house and people <br> Make a moving picture focusing on cutting, shaping, joining. <br> Toys <br> Healthy eating | Year 2 <br> Construction mechanisms and models Healthy Eating (food and nutrition) | Year 3 <br> Roman Shields - <br> History <br> Pencils cases <br> Moving monsters | Year 4 <br> Greenhouses - Link to Science (The water cycle) and Geography (biomes) <br> Short project 'switches' or longer project 'Light up sign' link to science (switches) <br> Seasonal cookery | Year 5 <br> Greenpower Challenge build an electric racing car, design the body work, learn to drive the car to race it at a public event. <br> PIE Challenge - think of an appealing product to sell to a target audience in order to make a profit. <br> Primary engineer leaders - interview an engineer about their field of work. Design their own invention to solve a problem. Enter a competition. | Year 6 <br> Clocks (Leavers' present) <br> Cooking and nutrition- Global food - pizza <br> Electrical componentsBattery operated lights - |
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| Suggested Texts/curriculum links | Nursery <br> The Gingerbread man The Three Little Pigs Rapunzel The Very Hungry Caterpillar We're Going on a Bear Hunt Hansel and Gretel Mad about Minibeasts <br> Reception <br> The Gingerbread man The Three Little Pigs Rapunzel | Year 1 <br> Non-fiction texts - toys, healthy eating? | Year 2 <br> Non-fiction texts Victorian toys, healthy eating? | Year 3 <br> Non-fiction texts (link to history and geography topics) | Year 4 <br> Greenhouses - Link to Science (The water cycle) and Geography (biomes) <br> Short project 'switches' or longer project 'Light up sign' link to science (switches) <br> Seasonal cookery | Year 5 <br> Link with local area topic - bridges building bridges <br> Science - properties of materials | Year 6 |
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| Suggested Visits | Nursery <br> Broxfield Farm - to learn about where our food comes from <br> Forest schools experiences, using natural objects, construction etc. <br> Forest schools, minibeast hotel, minibeast habitats <br> Scotswood Gardens natural objects, building habitats, clay model <br> Minibeasts <br> Reception <br> Forest schools experiences, using natural objects, construction etc. <br> Local churches/buildings of interest | Year 1 <br> Discovery museum <br> Build a Bear workshop <br> Broxfield Farm | Year 2 <br> Beamish Museum | Year 3 <br> Visit to local river (River Tyne - link to local history study Romans) | Year 4 <br> Potential visits to local garden centre <br> Local farm and supermarket visits | Year 5 <br> Race at Gateshead <br> Stadium - Greenhouse <br> challenge (car) <br> Visit to local river River <br> Tyne - link to local <br> history study <br> Visit to local businesses/workplace to sell product (e.g. <br> Robertson) | Year 6 <br> Nissan factory |
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