What must be taught in Design Technology?

EYs Development Matters:

- Beginning to be interested in and describe the texture of things.
- Uses various construction materials.
- Experiments to create different textures.
- Manipulates materials to achieve a planned effect.
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function
- Understands that equipment and tools have to be used safely.
- Eats a healthy range of foodstuffs and understands need for variety in food.
- Children know the importance for good health of physical exercise, and a healthy diet
- Children know about and can make healthy choices in relation to healthy eating and exercise.

KS1 NC requirements:

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.

DESIGN AND TECHNOLOGY SKILLS AND PROGRESSION

Skills	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Developing, planning and communicating ideas	**Nursery** Development Matters (22-36m) Experiments with blocks, colours and marks. Beginning to use representation to communicate, e.g. drawing a line and saying 'That's me.' Seeks to acquire basic skills in turning on and operating some ICT equipment. Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car. Development Matters (30-50m) Understands that they can use lines to enclose a space, and then begin to use these shapes to represent objects. Beginning to be interested in and describe the texture of things.	Begin to draw on their own experience to help generate idea. Begin to understand the development of existing products: What they are for, how they work, materials used. Start to suggest ideas and explain what they are going to do. Understand how to identify a target group for what they intend to design and make based on a design criteria. Begin to develop their ideas through talk and drawings. Make templates and mock ups of their ideas in card and paper or using ICT following a design criteria.	Start to generate own ideas by drawing on their own and other people's experiences. Begin to develop their design ideas and plan what to do next through discussion, observation, drawing and modelling. Identify a purpose for what they intend to design and make. Understand how to identify a target group for what they intend to design and make based on a design criteria. 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. Design a product for others following a design criteria. Choose the best materials and tools for the product and give reasons why	With growing confidence generate ideas for an item, considering its purpose and the user/s. Know to make drawings/sketches with accurate labels when designing. 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. Identify a purpose and establish a specific criteria for a successful product. Understand how well products have been designed, made and what materials have been used and the construction technique. Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.	Start to generate ideas, considering the purposes for which they are designing- link with Mathematics and Science. 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. Identify the strengths and areas for development in their ideas and products. Learn about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products. When planning explain their choice of materials and components according to function and aesthetic.	Start to generate develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces to show their design. Confidently develop a clear idea of what has to be done, planning step by step how to use materials, equipment and processes. Suggest some alternative plans to give a range of ideas and say what the good points and drawbacks are about each suggesting alternative methods of making if the first attempts fail. Begin to use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. Use the results of investigations, information sources,	Generate, develop and model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces to show their design. Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. Accurately apply a range of finishing techniques, including those from art and design. Draw up a specification for their design- link with Mathematics and Science. Plan the order of their work, choosing appropriate materials, tools and techniques.

	Reception Development Matters (40-60m+) Uses talk to organise, sequence and clarify thinking ideas.			Start to understand whether products can be recycled or reused. Explore, develop and communicate design proposals by modelling ideas and begin to explain their choices of materials and components.	Evaluate existing products and identify criteria that can be used for their own designs. When planning explain their choice of materials and components according to function and appearance. Be able to devise a template.	including ICT when developing design ideas. With growing confidence select appropriate materials, tools and techniques. Start to understand how much products cost to make, how sustainable and innovative they are and the impact products have beyond their intended purpose	Suggest alternative methods of making if the first attempts fail. Identify the strengths and areas for development in their ideas and products. Know how much products cost to make, how sustainable and innovative they are and the impact products have beyond their intended purpose. To justify their plan to others.

Skills	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working with tools, equipment, materials and components to make quality products.	**Nursery** Development Matters (22-36m) Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car. Seeks to acquire basic skills in turning on and operating some ICT equipment. Development Matters (30-50m) Uses various construction materials. Captures experiences and responses with a range of media, such as music, dance and paint and other materials or words. Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements. Uses one handed tools and equipment. **Reception** Development Matters (40-60m+)	Begin to make their design using appropriate techniques such as joining, folding or rolling. With help measure, mark out, cut and shape a range of materials. Begin to build structures, exploring how they can be made stronger, stiffer and more stable. (rolling, joining, folding) Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. Explore using tools e.g. scissors and a hole punch safely to cut, shape, join and finish. Begin to assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape. Begin to use simple finishing techniques to improve the appearance of their product. Begin to choose materials and explain why they are being used.	Begin to select tools and materials; use correct vocabulary to name and describe them. Measure, cut and score with some accuracy. Build structures, exploring how they can be made stronger, stiffer and more stable. Start to assemble, join and combine materials in different ways in order to make a product. Demonstrate how to cut, shape and join fabric to make a simple product. Use basic sewing techniques. Start to choose and use appropriate finishing techniques based on own ideas. Choose materials and explain why they are being used depending on their characteristics. Add axels and wheels in my work.	Select a wider range of tools and techniques for making their product i.e. construction materials and kits, textiles, food ingredients, mechanical components and electrical components. Measure, mark out, cut, score and assemble components with more accuracy. Explain their choice of tools and equipment in relation to the skills and techniques they will be using. Start to understand that mechanical and electrical systems have an input, process and output. Start to understand that mechanical systems such as levers and linkages or pneumatic systems create movement. Know how simple electrical circuits and components can be used to create functional products. Start to work safely and accurately with a range of simple tools.	Select a wider range of tools and techniques for making their product safely. Know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. Start to join and combine materials and components accurately in temporary and permanent ways. Know how mechanical systems such as cams or pulleys or gears create movement. Understand how more complex electrical circuits and components can be used to create functional products. Understand how to reinforce and strengthen a 3D framework. Demonstrate how to measure, tape or pin, cut and join fabric with some accuracy. Begin to use finishing techniques to	Select appropriate materials, tools and techniques e.g. cutting, shaping, joining and finishing, accurately. Measure and mark out more accurately, use skills in using different tools and equipment safely and 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. Understand how mechanical systems such as cams or pulleys or gears create movement. Know how more complex electrical circuits and components can be used to create functional products. Understand that mechanical and electrical systems have an input, process and output. Demonstrate how to use skills in using different tools and equipment safely and accurately	Confidently select materials, tools and techniques e.g. cutting, shaping, joining and finishing, accurately. Use tools safely and precisely. Assemble components to make working models. Aim to make and to achieve a quality product. With confidence pin, sew and stitch materials together to create a product. Demonstrate when make modifications as they go along. Construct products using permanent joining techniques. Understand how mechanical systems such as cams or pulleys or gears create movement. Know how more complex electrical circuits and components can be used to create functional products

	Manipulates materials to achieve a planned effect. Selects appropriate resources and adapts work where necessary. Constructs with a purpose in mind, using a variety of resources. Uses simple tools and techniques competently and appropriately. Selects tools and techniques needed to shape, assemble and join materials they are using. Handles tools, objects, construction and malleable materials safely and with increasing control. Handles tools, objects construction and malleable materials safely with increasing control			Start to think about their ideas as they make progress and be willing to change things if this helps them to improve their work. Start to measure, tape or pin, cut and join fabric with some accuracy. Begin to sew using a range of different stitches, to weave and knit.	strengthen and improve the appearance of their product using a range of equipment including ICT.	with growing confidence cut and join with accuracy to ensure a good-quality finish to the product. Weigh and measure accurately (time, dry ingredients, liquids). Use finishing techniques to strengthen and improve the appearance of their product using a range of equipment including ICT. Make a product which uses both electrical and mechanical components.	and how to program a computer to monitor changes in the environment and control their products. Know how to reinforce and strengthen a 3D framework. Understand that mechanical and electrical systems have an input, process and output. Use finishing techniques to strengthen and improve the appearance of their product using a range of equipment including ICT. To work with constraints.

Skills	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evaluating processes and products	**Nursery** Development Matters (30-50m) Talks about how things work or why things happen. **Reception** Development Matters (40-60m+) Selects appropriate resources and adapts work where necessary. Reviewing how well the approach worked.	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. Be able to say how existing products work.	Evaluate their work against their design criteria. Look at a range of existing products explain what they like and dislike about products and why. Start to evaluate their products as they are developed, identifying strengths and what went well as well as possible changes they might make. With confidence talk about their ideas, saying what they like and dislike about them. 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? Begin to disassemble and evaluate familiar existing products and consider the views of others to improve them. 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? Evaluate their products carrying out appropriate tests. Start to evaluate their work both during and at the end of the assignment to improve the original design. Be able to disassemble and evaluate familiar products and consider the views of others to improve them. 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. Evaluate their work both during and at the end of the assignment to ensure that the design is the best it can be. Begin to evaluate it personally and seek evaluation from others. Evaluate the key designs of individuals in design and technology has helped shape the world. Evaluate the final products appearance and functionality against original criteria.	Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. Evaluate their work both during and at the end of the assignment. Record their evaluations using drawings with labels. Evaluate against their original criteria and suggest ways that their product could be improved. Evaluate the key designs of individuals in design and technology has helped shape the world. Confidently evaluate the final products appearance and functionality against original criteria.

Skills	Early Years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Food and Nutrition	**Nursery** Development Matters (30-50m) Understands that equipment and tools have to be used safely. **Reception** Development Matters (40-60m+) Eats a healthy range of foodstuffs and understands need for variety in food. Shows understanding of how to transport and store equipment safely (e.g. knives and forks). Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. Children know about and can make healthy choices in relation to healthy eating and exercise. Development Matters (ELG) They safely use and explore a variety of	Begin to understand that all food comes from plants or animals. Explore the understanding that food has to be farmed, grown elsewhere (e.g. home) or caught, from underground/overground. Start to understand how to name and sort foods into the five groups in 'The Eat well plate' Begin to understand that everyone should eat at least five portions of fruit and vegetables every day. Know how to prepare simple dishes safely and hygienically, without using a heat source. Know how to use techniques such as cutting, peeling and grating.	Understand that all food comes from plants or animals. Know that food has to be farmed, grown elsewhere (e.g. home) or caught. Understand how to name and sort foods into the five groups in 'The Eat well plate' Know that everyone should eat at least five portions of fruit and vegetables every day. Demonstrate how to prepare simple dishes safely and hygienically, without using a heat source. Demonstrate how to use techniques such as cutting, peeling and grating. Describe the properties of the ingredients they are using.	Start to know 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. Understand how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. Begin to understand how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. Start to understand that a healthy diet is made up from a variety and balance of different food and drink, as depicted in 'The Eat well plate' Begin to know that to be active and healthy, food and drink are	Understand 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. Understand how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in 'The Eat well plate' Know that to be active and healthy, food and drink are	Understand 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. Begin to understand that seasons may affect the food available. Understand how food is processed into ingredients that can be eaten or used in cooking. Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. Start to understand how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. Begin to understand that different food and drink contain different substances – nutrients,	Know 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. Understand that seasons may affect the food available. Understand how food is processed into ingredients that can be eaten or used in cooking. Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source. Understand how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.

	materials, tools and techniques, experimenting with • Colour • design, • texture, • form, • and function. Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.			needed to provide energy for the body.	needed to provide energy for the body. Know how to present their product well.	water and fibre – that are needed for health.	Know different food and drink contain different substances – nutrients, water and fibre – that are needed for health.

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

Topics/Suggested topics	Nursery Traditional tales, People Who Help Us, Minibeasts Christmas Cards Mothers/Fathers Day cards Festivals and Celebrations Halloween baking, Diwali diva lamps. Reception Traditional tales, Houses and homes, What a Wonderful World! Christmas Cards Mothers/Fathers Day cards Food and Nutrition – baking	Year 1 Mechanisms – house and people Make a moving picture focusing on cutting, shaping, joining. Toys Healthy eating	Year 2 Construction – mechanisms and models Healthy Eating (food and nutrition)	Year 3 Roman Shields – History Pencils cases Moving monsters	Year 4 Greenhouses – Link to Science (The water cycle) and Geography (biomes) Short project 'switches' or longer project 'Light up sign' link to science (switches) Seasonal cookery	Year 5 Greenpower Challenge – build an electric racing car, design the body work, learn to drive the car to race it at a public event. PIE Challenge - think of an appealing product to sell to a target audience in order to make a profit. Primary engineer leaders – interview an engineer about their field of work. Design their own invention to solve a problem. Enter a competition.	Year 6 Clocks (Leavers' present) Cooking and nutrition- Global food – pizza Electrical components- Battery operated lights –

Suggested Texts/curriculum links	**Nursery** 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 **Reception** The Gingerbread man The Three Little Pigs Rapunzel	Year 1 Non-fiction texts – toys, healthy eating?	Year 2 Non-fiction texts – Victorian toys, healthy eating?	Year 3 Non-fiction texts (link to history and geography topics)	Year 4 Greenhouses – Link to Science (The water cycle) and Geography (biomes) Short project 'switches' or longer project 'Light up sign' link to science (switches) Seasonal cookery	Year 5 Link with local area topic – bridges – building bridges Science – properties of materials	Year 6

Suggested Visits	Nursery **Broxfield Farm** – to learn about where our food comes from **Forest schools** experiences, using natural objects, construction etc. **Forest schools**, minibeast hotel, minibeast habitats **Scotswood Gardens** – natural objects, building habitats, clay model Minibeasts **Reception** **Forest schools** experiences, using natural objects, construction etc. **Local churches/buildings of interest**	Year 1 Discovery museum Build a Bear workshop Broxfield Farm	Year 2 Beamish Museum	Year 3 Visit to local river (River Tyne - link to local history study - Romans)	Year 4 Potential visits to local garden centre Local farm and supermarket visits	Year 5 Race at Gateshead Stadium – Greenhouse challenge (car) Visit to local river River Tyne - link to local history study Visit to local businesses/workplace to sell product (e.g. Robertson)	Year 6 Nissan factory