



Language highlighted in red is non-negotiable language which must be displayed and understood.

Age	Opportunities for Developing Design and Technology in Foundation 1
Birth to 3 Years	Mathematics: - Compare sizes, weights using gesture and language (bigger/little/smaller/low/high/tall/heavy). Expressive Arts and Design: - Starts to make marks intentionally. - Explore paint, using fingers and other parts of their bodies as well as brushes and other tools. - Explore different materials, using all their senses to investigate them. Manipulate to play with different materials. - Use their imagination as they consider what they can do with different materials. - Make simple models which express their ideas. - Express ideas through making marks and sometimes giving meaning to the marks they make. Physical Development: - Build independently with a range of appropriate resources. - Explore different materials and tools. - Develop manipulation and control.
3-4 Year olds	Communication and Language: - Learn new vocabulary. - Ask questions to find out more and to check they understand what has been said to them. Mathematics: - Select shapes appropriately for building. Combine shapes to make new ones. Expressive Arts and Design: Join different materials and explore textures. - Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. - 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. Personal, Social and Emotional Development: - Select activities and use resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them. - Make healthy choices about food and drink. Physical Development: - Choose the right resources to carry out their own plan. - Use one-handed tools and equipment, for example, making snips in paper with scissors. Understanding the world: - Explore how things work. - Use all their senses in a hands-on exploration of natural materials. - Explore collections of materials with similar/ and or different properties.

- Talk about what they see, using a wide vocabulary.
- Talk about the **differences** between materials and the changes they notice.

Opportunities for Developing Design and Technology in Foundation 2:

Physical Development:

- Develop their small motor skills so that they can use a range of **tools** competently, **safely and confidently**.

Communication and Language:

- Articulate their **ideas** and **thoughts** in well-formed sentences.

Expressive Arts and Design:

- Explore, use and **refine** a variety of artistic effects to **express** their ideas and feelings.
- Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- Create collaboratively, sharing ideas, resources and skills.

Physical Development:

- Manage their own basic **hygiene** and **personal needs**, including dressing, going to the toilet and understanding the importance of **healthy food choices**.
- Use a range of small tools, including scissors, paintbrushes and cutlery.

Expressive Arts and Design: Creating with Materials

- **Safely use** and explore a variety of **materials**, **tools** and **techniques**, experimenting with colour, **design**, **texture**, **form** and **function**.
- Create collaboratively, share their creations, explaining the **process** that they have used.

Understanding the world:

- Explore the natural **world** around them.

Personal, Social and Emotional Development:

- Manage their own **needs**.

Mathematics:

- Compare **length**, **weight** and **capacity**.
- Compose and decompose shapes to make new ones.

Year	Branch Knowledge	Root Skills (Disciplinary knowledge)	Leaf Knowledge (Specific Details of Learning) (Substantive knowledge)
1	Food Preparing fruit and vegetables (including cooking nutrition requirements for KS1). Mechanisms Sliders and levers Structures Freestanding structures	Design- Understanding contexts, users and purposes. Design- Generating, developing, modelling and communicating ideas. Make- Planning. Make- Practical skills and techniques.	Use simple design criteria , state what their products are, who and what they are for and how they will work. Generate ideas using their own experiences and existing products; use talk, drawing, templates , mock-ups and where appropriate computers. Plan by suggesting what to do next; select from a range of tools , equipment , materials and components . Follow procedures for safety and hygiene; measure , mark out, cut, shape, assemble , join , combine and finish a range of materials and components. Make simple judgements about their products and ideas against the design criteria.

		Evaluate--Own ideas and existing products. Evaluate-Existing products. Technical knowledge- Making products work. Cooking and Nutrition- Where food comes from. Cooking and Nutrition-Food preparation, Cooking and Nutrition	Explore who and what products are for, how they work and are used, what materials they are made from and what they like and dislike about them. Know about the simple working characteristics of materials and components, the movement of simple mechanisms, how freestanding structures can be made stronger, stiffer and more stable; use the correct technical vocabulary Know that food comes from plants or animals and that it is farmed or caught. Know how to prepare simple dishes safely and hygienically without a heat source, name and sort foods into groups; know that everyone should eat at least five portions of fruit and vegetables a day.
2	Textiles Templates and joining techniques Mechanisms Wheels and axles Food Preparing fruit and vegetables (including cooking nutrition requirements for KS1).	Design- Understanding contexts, users and purposes. Design- Generating, developing, modelling and communicating ideas. Make- Planning. Make- Practical skills and techniques. Evaluate--Own ideas and existing products. Evaluate-Existing products. Technical knowledge- Making products work. Cooking and Nutrition- Where food comes from. Cooking and Nutrition-Food preparation, Cooking and Nutrition	Use simple design criteria, state what their products are, who and what they are for and how they will work. Generate ideas using their own experiences and existing products; use talk, drawing, templates, mock-ups and where appropriate computers. Plan by suggesting what to do next; select from a range of tools, equipment, materials and components. Follow procedures for safety and hygiene; measure, mark out, cut, shape, assemble, join, combine and finish a range of materials and components. Make simple judgements about their products and ideas against the design criteria. Explore who and what products are for, how they work and are used, what materials they are made from and what they like and dislike about them. Know about the simple working characteristics of materials and components, the movement of simple mechanisms, how freestanding structures can be made stronger, stiffer and more stable; use the correct technical vocabulary Know that food comes from plants or animals and that it is farmed or caught. Know how to prepare simple dishes safely and hygienically without a heat source, name and sort foods into groups; know that everyone should eat at least five portions of fruit and vegetables a day.
3	Food	Design – Understanding contexts, users and purposes.	Develop their own design criteria ; describe the user, purpose and design features of their products and explain how they will work.

	Healthy and varied diet, including cooking and nutrition requirements for KS2. Mechanical Systems Leavers and linkages. Electrical Systems Simple circuits and switches, including programming and control.	Design – Generating, developing, modelling and communicating ideas. Make – Planning. Make – Practical skills and techniques. Evaluate – Own Ideas and products. Evaluate – Existing Products. Evaluate – Key events and individuals. Technical Knowledge- Making products work. Cooking Nutrition-Where food comes from. Cooking Nutrition- Food preparation, cooking and nutrition.	Generate realistic ideas based on user needs; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design. Order the main stages of making; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy. Evaluate their ideas and products against their design criteria. Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products. Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control their products; how to make strong, stiff shell structures; use the correct technical vocabulary. Know that food is grown, reared and caught in the UK, Europe and the wider world. Know how to prepare a variety of dishes safely and hygienically; that a healthy diet is made from a variety and balance of different food and drink; that food and drink are needed to provide energy for the body.
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4	Textiles 2-D shape to 3-d product. Structures Shell structures (including computer-aided design). Food Healthy and Varied Diet, including cooking and nutrition requirements for KS2.	Design – Understanding contexts, users and purposes. Design – Generating, developing, modelling and communicating ideas. Make – Planning. Make – Practical skills and techniques. Evaluate – Own Ideas and products. Evaluate – Existing Products. Evaluate – Key events and individuals. Technical Knowledge- Making products work. Cooking Nutrition-Where food comes from. Cooking Nutrition- Food preparation, cooking and nutrition.	Develop their own design criteria; describe the user, purpose and design features of their products and explain how they will work. Generate realistic ideas based on user needs; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design. Order the main stages of making; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with some accuracy. Evaluate their ideas and products against their design criteria. Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used and how well they work. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products. Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control their products; how to make strong, stiff shell structures; use the correct technical vocabulary. Know that food is grown, reared and caught in the UK, Europe and the wider world. Know how to prepare a variety of dishes safely and hygienically; that a healthy diet is made from a variety and balance of different food and drink; that food and drink are needed to provide energy for the body.
5	Structures Free standing structures (including computer-aided design). Mechanical systems: Pulleys or gears Food Celebrating culture and seasonality (including cooking and nutrition requirements for KS2).	Design – Understanding contexts, users and purposes. Design – Generating, developing, modelling and communicating ideas. Make – Planning. Make – Practical skills and techniques.	Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work. Generate innovative ideas drawing on research; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design. Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy.

		Evaluate – Own Ideas and products. Evaluate – Existing Products. Evaluate – Key events and individuals. Technical Knowledge- Making products work. Cooking Nutrition-Where food comes from. Cooking Nutrition- Food preparation, cooking and nutrition.	Identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements. Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products. Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary. Know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients. Know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health.
6	Textiles: Combining different fabric shapes (included computer-aided design). Electrical systems: More complex switches and circuits (including programming, monitoring and control). Food: Celebrating culture and seasonality (including cooking and nutrition requirements).	Design – Understanding contexts, users and purposes. Design – Generating, developing, modelling and communicating ideas. Make – Planning. Make – Practical skills and techniques. Evaluate – Own Ideas and products. Evaluate – Existing Products. Evaluate – Key events and individuals. Technical Knowledge- Making products work.	Carry out research; develop a simple design specification; describe the user, purpose and design features of their products and explain how they will work. Generate innovative ideas drawing on research; use a range of drawing skills, discussion, prototypes, pattern pieces and computer-aided design. Formulate lists of resources and step-by-step plans; select suitable tools, equipment, materials and components and explain their choices. Follow procedures for safety and hygiene; use a wider range of materials and components; measure, mark out, cut, shape, assemble, join, combine and finish with accuracy. Identify strengths and areas to develop in their ideas and products against their design specification; consider the views of others to make improvements. Investigate how well products have been designed and made, whether they are fit for purpose and meet user needs; why materials have been chosen, the methods of construction used, how well they work, and how innovative and sustainable they are. Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products.

		Cooking Nutrition-Where food comes from. Cooking Nutrition- Food preparation, cooking and nutrition.	Know that materials have functional and aesthetic qualities; that systems have an input, process and output; how to program a computer to control and monitor their products; how to reinforce and strengthen a framework; use the correct technical vocabulary. Know that food is grown, reared and caught in the UK, Europe and the wider world; that seasons may affect the food available; how food is processed into ingredients. Know how to prepare and cook a variety of dishes safely and hygienically using, where appropriate, a heat source; that different food and drink contain nutrients, water and fibre that are needed for health.
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Substantive Knowledge: Substantive knowledge is the carefully sequenced, **factual knowledge we learn through our curriculum** (underpinned by the expectations set out in the National Curriculum)

Substantive knowledge cannot be learnt in isolation, but requires prior knowledge that enables us to make sense of what we have learn. We learn this through the sequencing of our lessons. Prior knowledge must be revisited to aid retention and misconceptions actively diagnosed to prevent perpetuating them. It is based on the knowledge of four key elements of the process of design (design, make, evaluate and technical knowledge). All of these elements will be taught from Reception to Year 6 and vocabulary is taught explicitly and will be deliberately practised and applied through the 4 key elements. These are: Design Know how to design a product that is purposeful, functional and appealing to a specific group. Make Know how to cut, join and finish a range of increasingly complex materials, ranging from paper to wood. Evaluate Know how to investigate, evaluate and analyse a range of existing products and their own designs based on a specific design criteria. In addition to this, children will know key individuals have helped to shape the world in which we live in. Technical knowledge Know how to apply their knowledge of specific materials to meet the criteria listed above in the design, make and evaluate stages.

Disciplinary knowledge: The action taken within a particular subject to gain knowledge. (**Pedagogical choices to aid learning**)

Disciplinary knowledge in design and technology is the process of enabling children to use their substantive knowledge of products and materials around them to make links between and across different areas of the curriculum. Knowledge in design and technology will equip the children with the opportunity to explain how and why products have changed over time and how they might be further improved in the future. They can use their knowledge and understanding to suggest how existing products may be improved with the advances in modern technology. Children will demonstrate that they have the cultural capital to become global citizens, following global themes and fundamental British Values, in an ever changing and technologically advancing world. In DT we learn through **researching, designing, making and evaluating products**.