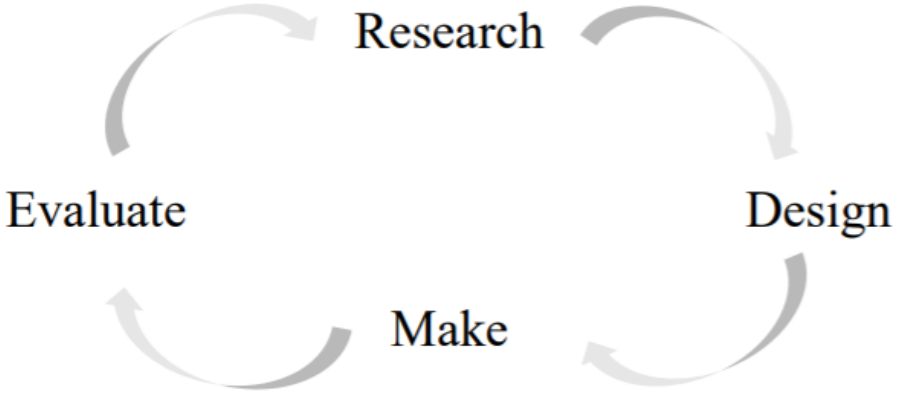
Sparsholt CofE Primary School

Knowledge, skills and understanding

Design and Technology



Development Matters in the Early Years Foundation Stage (EYFS)

Expressive Arts and Design

EYFS Statutory Educational Programme:

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Children at the expected level of development will:

3 – 4 Year olds	**Early Learning Goals**
Explore different materials freely, 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 Join different materials and explore different textures?	ELG: Children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. ELG: Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.

National Curriculum Requirements of Design and Technology for Key Stage 1

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 and school, gardens and playgrounds, the local community, industry and the wider environment].

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.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Knowledge, Skills and Understanding breakdown for Design and Technology Year 1

Year 1		
Developing, planning and communicating ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluating processes and products**
• Can they think of some ideas of their own? • Can they explain what they want to do? • Can they use pictures and words to plan?	• Can they explain what they are making? • Can they explain which tools are they using?	• Can they describe how something works? • Can they talk about their own work and things that other people have done?

Breadth of study			
Cooking and nutrition	**Textiles**	**Mechanisms** **<u>Wheels an axels</u>**	**Use of materials/Construction** **<u>Freestanding structures</u>**
Can they peel, chop, slice and grate foods? Can they describe the texture of foods? Do they wash their hands and make sure that surfaces are clean? Can they think of interesting ways of decorating food they have made, e.g. cakes?	To know what a template is Can they describe how different textiles feel? Can they use a range of tools? E.g. scissors and a hole punch safely? Can they make a product from textiles by gluing? Can they make a product from textiles by weaving?	Do they know the difference between fixed and free moving axels? Do they know simple methods to fix wheels and axels to a product? Can they make a product which moves? Can they say why they have chosen moving parts?	Can they talk with others about how they want to construct their products? Can they select appropriate resources and tools for their building projects? Can they make simple plans before making objects, e.g. drawing, arranging pieces of construction before building? Do they know how to make freestanding structures stronger, stiffer and make stable? Can they make a structure using different materials? Is their work tidy?

Knowledge, Skills and Understanding breakdown for Design and Technology Year 2

Year 2		
Developing, planning and communicating ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluating processes and products**
• Can they think of ideas and plan what to do next? • Can they choose the best tools and materials? Can they give a reason why these are best? • Can they describe their design by using pictures, diagrams, models and words?	• Can they join things (materials/components) together in different ways?	• Can they explain what went well with their work? • If they did it again, can they explain what they would improve?

Breadth of Study			
Cooking and nutrition	**Textiles**	**Mechanisms** **<u>Sliders and Levers</u>**	**Use of materials/Construction** **<u>Freestanding structures</u>**
Can they describe the properties of the ingredients they are using? Do they know how to prepare simple dishes safely and hygienically, without using a heat source? Eg. a sandwich, fruit kebabs, fruit smoothie, salad Can they use techniques such as cutting, peeling and grating with greater confidence and independence? Can they explain what it means to be hygienic? Are they hygienic in the kitchen?	Do they know why designers use templates? Can they measure and cut with accuracy? Can they assemble, join and cut materials in order to make a product? Can they explain why they chose a certain textile? Can they cut, shape and join a fabric to make a simple garment using basic sewing techniques?	Can they operate sliders and levers? Do they know that different mechanisms create different types of movement? Can they join materials together as part of a moving product? Can they add some kind of design to their product?	Can they measure materials to use in a structure? Can they use joining, folding or rolling to make it stronger? Can they make sensible choices as to which materials to use to make structures stronger, stiffer and more stable? Can they develop their own ideas from initial starting points? Can they consider how to improve their structure?

National Curriculum Requirements of Design and Technology for Key Stage 2

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.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

- 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.

Knowledge, Skills and Understanding breakdown for Design and Technology Year 3

Year 3		
Developing, planning and communicating ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluation processes and products**
• Can they show that their design meets a range of requirements? • Can they put together a step-by-step plan which shows the order and also what equipment and tools they need? • Can they describe their design using an accurately labelled sketch and words? • How realistic is their plan?	• Can they use equipment and tools accurately?	• Can they explain what they changed which made their design even better?

Breadth of study			
Cooking and nutrition	**Textiles**	**Electrical and mechanical components**	**Stiff and flexible sheet materials** **<u>Shell Structures</u>**
Can they chop a wider range of foods using different techniques? Eg. claw grip, bridge grip Can they combine foods using different utensils Eg. whisk, spatula? Can they use sensory information to evaluate a variety of ingredients? Can they make sure that their product looks attractive and describe how their combined ingredients come together? Do they know relevant health and safety procedures when handling and preparing foods? (see vocab)	Can they measure, mark out, cut and join textiles of different types in different ways? Can they choose textiles both for their appearance an also qualities?	Do they select the most appropriate tools and techniques to use for a given task? Do they know what an electrical circuit is and know a range of electrical components and their functions, such as a bulb, buzzer and switch Can they make a product which uses both electrical and mechanical components? Can they use a simple circuit? Can they use a number of components?	Do they use the most appropriate materials? Can they use more sophisticated methods for stiffening/strengthening structures? Do they know the names of more complex 3D shapes? Can they work accurately to make cuts and bolts? Can they measure, mark out, cut and join materials in different ways? Can they test a material's strength?

Knowledge, Skills and Understanding breakdown for Design and Technology Year 4

Year 4		
Developing, planning and communicating ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluating processes and products**
• Can they come up with at least one idea about how to create their product? • Do they take account of the idesa of others when designing? • Can they produce a plan and explain it ot others? • Can they suggest some improvments and say what was good and not so good about their original design?	• Can they tell if their finished product is going to be good quality? • Are they aware of the need to produce something that will be liked by others? • Can they show a good level of expertise when using a range of tools and equipment? • Do they work at their product even though their original idea might not have wored?	• Have they thought of how they will check if their design is successful? • Can they begin to explain how they can improve their original design? • Can they evaluate their product, thinking of both appearance and the way it works? • Do they take time to consider how they could have made their idea better?

Breadth of study			
Cooking and nutrition	**Textiles**	**Electrical and mechanical components**	**Stiff and flexible sheet materials** **<u>Shell Structures</u>**
Do they know how to measure ingredients using simple measures? Eg. cup, tbsp. Do they know how to combine foods using different utensils? Eg. whist, spatula Can they use sensory information to evaluate a variety of ingredients? Have they thought what they can do to present their product in an interesting way? Do they know relevant health and safety procedures when handling and preparing foods? (see vocab	Do they think what the user would want when choosing textiles? Have they thought about how to make their product strong? Can they devise a template? Can they explain how to join things in a different way? Can they measure, mark out, cut and shape a range of materials using appropriate tools, equipment and techniques?	Do they know what an electrical circuit is and know a range of simple electrical components and their functions? Eg. a bulb, buzzer and switch Can they make a simple circuit and add components to their circuits? How have they altered their product after checking it? Are they confident about trying out new and different ideas?	Can they measure carefully to make sure they have not made mistakes? Can they use more sophisticated methods for stiffening/strengthening structures? Can they select appropriate tools and techniques for making their product? Can they measure, mark out, cut and shape a range of materials using appropriate tools, equipment and techniques? Can they a test a material's strength?

Knowledge, Skills and Understanding breakdown for Design and Technology Year 5

Year 5		
Developing, planning and communiation ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluating processes and products**
• Can they come up with a range of ideas after they have collected information? • Do they take a user's view into account when designing? • Can they produce a detailed step-by-step plan? • Can they suggest some alternative plans and say what the good points and drawbacks are about each?	• Can they explain why their finished product is going to be of good quality? • Can they explain how their product will appeal to the audience? • Can they use a range of tools and equipment expertly? • Do they persevere through different stages of the making process?	• Do they keep checking that their design is the best it can be? • Do they check whether anything could be improved? • Can they evaluate apearance and function against the original criteria?

Breadth of study			
Cooking and nutrition	**Textiles**	**Electrical and mechanical components**	**Stiff and flexible sheet materials** **<u>Frame Structures</u>**
Can they use some more advanced methds for mixing ingredients? Eg. rubbing in Can they weigh and measure accurately using different units? Eg. time, dry ingredients, liquid Can they follow a receipe? Can they select appropriate utensils for specific jobs? How have they presented their product? Can they describe what they do to be both hygenic and safe? Eg. hazards relating to the use of ovens	Do they think what the user would want when choosing textiles? How have they made their product attractive and strong? Can they make up a protype first? Can they use a range of joining techniques? Can they measure and mark out accurately? Can they use skills in using different tools and equipment safely and accurately?	Do they know how simple switches are made? Can they incorporate a switch into their product? Do they know how to test components in more complext circuits? Can they refine their product after testing it? Can they incorporate hydraulics and pneumatics?	Do they know how to stiffen strengthen and reinforce a range of 3D frameworks? Do they know which materials are best suited to stiffen and reinforce by selecting them due to their properties? Are their measurements accurate enough to ensure that everything is precise? Do they know which shapes are the strongest and will support the most weight in a structure? Can they use skills in using different tools and equipment safely and accurately? Eg. junior hacksaw, G-clamps, bench hooks, hand drills

Knowledge, Skills and Understanding breakdown for Design and Technology Year 6

Year 6		
Developing, planning and communicating ideas	**Working with tools, equipment, materials and components to make quality products**	**Evaluating processes and products**
• Can they use a range of information to inform their design? • Can they use market research to inform plans? • Can they work within constraints? • Can they follow and refine their plan if necessary? • Can they justify their plan to someone else? • Do they consider culture and society in their designs?	• Can they tools and materials precisely? • Do they change the way they are working if needed?	• How well do they test and evaluate their final product? • Is it fit for purpose? • What would improve it? • Would different resource have improved their product? • Would they needs more or different information to make it even better? • Does their product meet all design criteria? • Did they consider the use of the product when selecting materials?

Breadth of study			
Cooking and nutrition	**Textiles**	**Electrical and mechanical components**	**Stiff and flexible sheet materials** **<u>Frame structures</u>**
Can they use some more advanced methds for mixing ingredients? Eg. rubbin in Can they weigh and measure accurately using different units? Eg. time, dry ingredients, liquid Can they follow a receipe? Can they select appropriate utensils for specific jobs? How have they presented their product?	Can they select appropriate tools, materials, components and techniques? Can they use tools safely and accurately? Can they pin, sew and stitch materials together to create a final product? Have they thought about how their product could be sold? Have they given considered thought about what would improve their product even more?	Do they know how to incorporate simple self-made switches in a circuit? Can they use different kinds of circuit in their product? Do they know how to assess faults in their own electrical systems? Can they think of ways in which adding a circuit would improve their product?	Can they select appropriate tools, materials, components and techniques and justify their choices? Do they know how to stiffen strengthen and reinforce a range of 3-D frameworks? Do they know which shapes are the strongest and will support the most weight in a structure?

Can they explain how their product should be stored with reasons? Can they describe what they do to be both hygienic and safe? Eg. hazards relating to the use of oven			Do they know which materials are best suited to stiffen and reinforce by selecting them due to their properties? Can they construct products using permanent joining techniques? Can they hide joints so as to improve the look of their product? Are their measurements accurate enough to ensure that everything is precise? Can they use skills in using different and equipment safely and accurately? Eg. junior hacksaw, G-clamps, bench hooks, hand drills