Creativity, Curiosity, Caring

Design and Technology Curriculum Sequence

Intent – Our Rationale	Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Aboyne Lodge we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers. It is the intent of Aboyne Lodge for Design Technology to be taught in all year groups through at least one topic per term, which includes one topic relating to food. Design Technology projects are made where possible cross curricular - linking to other subjects taught. The teaching of Design Technology across the school follows the National Curriculum through the use of 'Planbee' documents. These documents are used as a basis for the teaching and have been adapted to our school. Children design products with a purpose in mind and an intended user of the products. Food technology is implemented across the school with children developing an understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this. We have identified the following strands as areas to focus on for Design and Technology: design; make; evaluate; structures; mechanisms; electrical systems; computing systems; and food technology. Textiles skills will be taught in our art curriculum and opportunities to use these within a design and technology context will be offered to children as a stand-alone activity. This plan allows for all areas to be covered thoroughly and a focus on the progression of skills.

Curriculum Drivers			
Sustainability	**Cultural Diversity**	**Growth Mindset**	**Oracy**

Structures						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic area	Homes *Shell/frame*	Wacky windmills *frame*	Packaging *shell*	Mini Greenhouses *shell*	Moving Toys (mechanisms) *frame*	Bird Houses / Fairgrounds *Frame/shell*
Know	- that there are different types of homes. - to know the different features of a home. - that there are different methods for joining materials.	-to know the function and features of a windmill. -to know that some materials are stronger than others. - how to construct a base and assess its sturdiness. - to know how to choose materials for a particular purpose. - how to plan and evaluate a product.	- that packaging can be deconstructed. - to understand that 3-D shapes can be constructed from nets. - how to cut out, mark, score and assemble a 3-D net. - that graphics can be used for specific effects. - how to evaluate the font, shape and design of a package. - how to design and evaluate their own product.	- what a greenhouse is used for. - factors that make a structure stable. - different ways of joining materials. - how to make a plan to a set criteria.	- different ways to strengthen a structure. - how to test the stability of a structure. - how to experiment with a range of tools, materials and techniques. - how to design and evaluate a frame structure.	- to know and describe the features of a birdhouse. - to know and draw and exploded and 3D diagram. - to know what tools and equipment are needed in order to work with wood. - safety precautions. - how to plan and adapt to aid construction.
Be able to	- design purposeful, functional, appealing	-design purposeful, functional, appealing products for themselves and	- use research and develop design criteria to inform the design of	- use research and develop design criteria to inform the design of	-use research and develop design criteria to inform the design of	- use research and develop design criteria to inform the design of

	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. - select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing	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. - explore and evaluate a range of existing products - build structures, exploring how they can be made stronger, stiffer and more stable	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 - 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	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 - select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately	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 - 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	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 - select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately (hand drill, saw, sand paper, clamp)

	- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics - explore and evaluate a range of existing products - evaluate their ideas and products against design criteria - build structures, exploring how they can be made stronger, stiffer and more stable		of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities - 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	- 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 - 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 - apply their understanding of how to strengthen, stiffen and reinforce more complex structures	of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities - 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	- 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 their ideas and products against their own design criteria and consider the views of others to improve their work

Understand this Vocabulary	Houses, homes, exterior, interior, join, combine, hinge, cut, fold, join, fix structure, wall, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, triangle, square, rectangle, circle.	cut, fold, join, fix structure, wall, tower, framework, weak, strong, stable, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder,	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, font, lettering, text, graphics, decision, evaluating, design brief design criteria, prototype	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity, marking out, scoring, shaping, tabs, adhesives, joining, assemble, material, stiff, strong, corrugating, ribbing, translucent, transparency, stable/unstable, frame, base.	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design prototype, annotated sketch, purpose, user, innovation, research, functional	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent, purpose, prototype, appearance, clamp, hammer, hand drill, dowel, saw, sand.

Mechanisms						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area	Moving Pictures	Fire Engines	Moving Monsters		Moving Toys	Fairgrounds
Know	- to know that different mechanisms provide different types of movement. - to know how to make a	- what the main features of a fire engine are. - what wheels, axis and chassis	- to know that some objects use air to make them work. - to know how simple pneumatic		- to know that cam mechanisms change rotary motion to linear motion.	- to know how a pulley and belt system can transfer movement. - to know how an electrical circuit with a

	sliding mechanism. - what the term lever and pivot mean. - how to combine and join materials to make a lever mechanism. - how to combine and join materials to make a wheel mechanism. - how to incorporate moving mechanisms into pictures. - to work safely with a range of equipment.	are and their function. - to know the difference between a loose and a fixed axel. - how to combine materials in different ways to create component parts. - how to join fixed and movable parts. - how to use tools safely.	systems work and use appropriate vocabulary. - how to construct a pneumatic system to control movement. - how to work safely and effectively with a range of tools and materials.		- to know example of cam toys and be able to explain how they work. - that different shaped cams affect the movement of the follower. - how to experiment with a range of tools, materials and techniques. - how to design a structure to support a cam mechanism.	motor can create rotating parts. - to know how to manipulate pulleys to create different movements. - to know how to plan to a certain criteria. - how to use equipment safely and correctly. - to know how to evaluate and make improvements to a plan.
Be able to do	- design purposeful, functional, appealing products for	- design purposeful, functional, appealing products for themselves and	- use research and develop design criteria to inform the		- use research and develop design criteria to inform the design of innovative,	-use research and develop design criteria to inform the design of innovative, functional, appealing

	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. - 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	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. - 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	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 - select from and use a wider range of tools and		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 - 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,	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 -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 -apply their understanding of how to strengthen, stiffen and reinforce more complex structures -understand and use mechanical systems in their products [for

	range of materials and components, including construction materials, textiles and ingredients, according to their characteristics - explore and evaluate a range of existing products - evaluate their ideas and products against design criteria - explore and use mechanisms [for example, levers, sliders], in their products	- explore and evaluate a range of existing products - evaluate their ideas and products against design criteria - explore and use mechanisms [for example, wheels and axles], in their products	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 their ideas and products against their own design criteria and		including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities - 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 and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	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

			consider the views of others to improve their work - understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]			
Understand this Vocabulary	slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards, backwards, mechanism, movement.	vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism, names of tools, equipment and materials used, components, parts, function.	control, pneumatic system, pressure, inflate, deflate, input, output, pump, hinge, model, design, materials, equipment, decorate, instructions, pivot, lever, hinge.		Cams Snail cam Cam shaft Eccentric cam Movement Hand powered mechanism Linear motion Rotation Follower Slider component	pulley, levers, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output, design decisions, functionality, innovation, authentic, user, purpose, design

						specification, design brief

Food Technology						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area	Seaside Snacks - savoury pinwheels/wraps - vegetable boats - milk lollies	Teddy Bears' Picnic - Omelette cakes - sweet and savoury skewers	Sandwich Snacks - sandwiches	Seasonal Food - fruit tarts - Stuffed Peppers - Meatballs	Bread - Bread	British Dishes - fruit crumble - Welsh Rarebit
Know	- how to use tools effectively and safely. - how to cut, grate, mash, mould. - that cooking, baking and freezing are all types of techniques. - different fruit and vegetables. - how to evaluate a product.	- how to use tools effectively and safely. - how to whisk, cook, skewer, cut, shape. - how to evaluate a product. - that food can change flavour and texture when cooked.	-how to taste and describe different food. -how to evaluate fillings and breads. - how to design a sandwich snack. - how to spread, cut, grate, shape, roll, skewer. -how to use tools effectively and safely.	- what 'seasonal foods' mean. - why some foods are available all year around. - that some fruits are suited to the climate and weather in Britain. - how fruit may be processed or preserved.	- how to compare and evaluate different bread products. - how to weigh and measure ingredients. - how to investigate and carry out research. - to work safely, hygienically	- the origins of different British dishes. - how to chop and cut safely. - what RDA for sugar is on packaging and how to monitor it. - the seasonality of different British fruit. - how to design and

				- why vegetables are part of a healthy lifestyle. - when some British vegetables are in season. - how fish and meat are reared and processed. - why it is good to eat seasonally. - how to use a variety of techniques safely and hygienically.	and accurately. - to plan and evaluate a product.	follow a simple recipe. - to adapt a recipe. - to use tools safely and effectively. - to evaluate a product.
Be able to do	design purposeful, functional, appealing products for themselves and other users based on design criteria - select from and use a range of tools and equipment to perform practical tasks [for example, cutting,	design purposeful, functional, appealing products for themselves and other users based on design criteria - select from and use a range of tools and equipment to perform practical	- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular	- 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	- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular	- 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

	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 their ideas and products against design criteria - use the basic principles of a healthy and varied diet to prepare dishes	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 their ideas and products against design criteria - use the basic principles of a healthy and varied diet to prepare dishes	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 - 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 - investigate and analyse a range of existing products - evaluate their ideas and products against their own	- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	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 - 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 - investigate and analyse a range of existing products - evaluate their ideas and products against their own	- understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

			design criteria and consider the views of others to improve their work - 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		design criteria and consider the views of others to improve their work - 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 this Vocabulary	Grate, mash, cut, mould, freeze, cook, bake, fruit, vegetable, roll, pastry, texture, taste.	whisk, cook, fry, skewer, cut, shape, fruit, vegetables, sweet, savoury, texture, taste.	spread, cut, grate, shape, roll, skewer, vegetable, salad, savoury, taste, texture.	Pastry, shape, crimp, bake, rise, filling, cut, stew, deseed, mould, mix, combine, fry, bake, taste, texture, sweet, savoury, seasonal.	Knead, yeast, rise, prove, combine, mould, shape, taste, texture, sweet, savoury, weigh, measure.	Chop, cut, mix, rub, peel, combine, filling, melt, grate, spread, taste, texture, sweet, savoury, measure, weigh.

Textiles						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area		Puppets	Pencil Cases		Christmas decorations*	Memory Blanket*
Know						
Be able to do						

Understand this Vocabulary						

*Stand alone projects rather than taught units.

Electrical						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area				Light up signs	Pioneering Programming	Fairgrounds
Know				- to identify features of illuminating signs. - how a simple circuit can be constructed. - the aesthetic and practical uses of LED bulbs. - appropriate ways to fit electrical components in their designs. - how to write an edit programs to	See objectives below	- to know how a pulley and belt system can transfer movement. - to know how an electrical circuit with a motor can create rotating parts. - to know how to manipulate pulleys to create different movements. - to know how to plan to a certain criteria. - how to use equipment

				control and LED light. - how to create algorithms with a set of instructions.		safely and correctly. - to know how to evaluate and make improvements to a plan.
Be able to do				- 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 - select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately		-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 -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

				- 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 - 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 - apply their understanding of how to strengthen, stiffen and reinforce more complex structures - 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		-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

				and control their products		
Understand this Vocabulary				Circuit, switch, bulb, motor, program, monitor, control, algorithm, LED, aesthetic, design, electrical.		pulley, levers, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output, design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief
Computing						
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area				Light up signs	Pioneering Programming	Fairgrounds
Know				See objectives above.	- how embedded systems monitor and control products. - to create prototypes of a	See objectives above.

					computer controlled electrical system. - how to incorporate more than one electrical component in their system. - how to debug their system. - to evaluate a program and their own design.	
Be able to do					-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 - select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately - 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 - 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	
Understand this Vocabulary					Algorithm, debug, design, circuit, electrical system, component, prototype,	