DT AT THE GROVE

INTENT

"Good buildings come from good people, and all problems are solved by good design." Stephen Gardiner

At the Grove, design and technology has a key part to play in our cross-curricular approach to learning and draws on a variety of curriculum areas such as science, computing, maths, art and engineering. Design and technology is taught throughout the year and children will leave the Grove being able to inventively think outside the box and use their ingenuity to creatively solve real world problems.

Design and technology is often brought to life through taking part in national competitions. The children love a challenge. Designing, making, testing, evaluating and improving their products for a real competition or situation results in some fantastic creations.

Children's skills are developed through creativity where they design, make and evaluate products to solve real and relevant problems. They have to take the context into consideration as well as the wants and needs of themselves and others, often drawing on inspiration from famous inventors. Children explore a variety of techniques and skills, from making structures stronger to using mechanisms, such as levers and sliders. They investigate and analyse existing products to make prototypes and then consider improvements to their designs before making their own final creations.

Cooking and nutrition is also an important part of design and technology. The children learn about a balanced diet and making healthy lifestyle choices, resulting in strong cross-curricular links with PE. Children are taught key food technology skills, from putting together fruit kebabs to making bread, building up life skills ready for when they leave the Grove and later on in life.

Many aspects of design technology can be found in the Mini and Junior Duke Awards which the children at the Grove participate in. The children complete challenges to build independence and life skills preparing them for life after school.

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IMPLEMENTATION

Our curriculum is built around deep thinking and encourages learners to use a question as the starting point, considering different avenues for further research. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They ask their own questions about what they observe and make some decisions about

which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use scientific language to talk and write about what they have found out.

Each knowledge topic is planned to retrieve knowledge previously covered and then follow our 4 stage sequence of teaching; ignite and inspire, deep practice, mastery and showcase. KS1 cover: textiles, mechanical systems, structures and food and nutrition. KS2 cover: textiles, mechanical systems, structures, food and nutrition, electrical systems and programming, monitoring and control. We ensure that learning is progressive and continuous.

Each DT topic begins with a design brief/hook to inspire a sense of excitement and curiosity for children – ignite and inspire. Teachers check on what children already know and then invite children to think of their own questions. During deep practice, the children begin by exploring existing products to support their initial designs before making their own product to match agreed success criteria. Completed products are evaluated by the design criteria and children consider how improvements could be made. Across both key stages, technical knowledge is embedded throughout the Design, Make and Evaluate process. Children will be supported through the mastery stage of the teaching sequence. Children will then have the opportunity to showcase their learning. This stage provides children with an opportunity to share their learning more widely with other children and parents through a variety of means e.g. learning presentations, talks, report writing etc.

Memorable knowledge and skills have been identified for each of the units to provide progressive acquisition of knowledge. This is supported by the use of 'sticky vocabulary and sticky knowledge' which are displayed on subject specific knowledge organisers. Teachers regularly refer to this knowledge and key vocabulary with meanings so that it 'sticks'. This enables children to readily apply knowledge and vocabulary.

IMPACT

DT learning is loved by teachers and children across school. The successful approach to the teaching of DT at The Grove School will result in a fun, engaging, high quality science education, that provides children with the foundations for understanding the world that they can take with them once they complete their primary education.

Assessment at The Grove School uses informal strategies (verbal/written outcomes, reflection tasks/presentations, retrieval practice games and activities).

Formative assessment is used as the main tool for assessing the impact of DT at The Grove School as it allows for misconceptions and gaps to be addressed more immediately rather than building on insecure foundations.

Children at The Grove School will:
- demonstrate a love of DT and an interest in further study and work in this field.
- retain knowledge that is pertinent to DT with a real life context.
- be able to question ideas and reflect on knowledge.
- be able to articulate their understanding of DT and discuss products using rich technical knowledge when describing the Design, Make and Evaluate process.

- work collaboratively and practical to create a product against design criteria.
- demonstrate their love of DT and the development of their skills through their final products.
- achieve age related expectations in DT at the end of their cohort year.

DT LONG TERM PLAN SHOWING KNOWLEDGE PROGRESSION

EYFS To be Year 1 ready, children in Foundation Stage will know:	How to choose the resources they need for their chosen activities. How to handle equipment and tools effectively. The importance for good health of a healthy diet How to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. How to use what they have learnt about media and materials in original ways, thinking about uses and purposes. How to represent their own ideas, thoughts and feelings through design and technology		
YEAR	AUTUMN TERM	SPRING TERM	SUMMER TERM
Year 1 and 2 Year A By the end of KS1, children will have the following knowledge:	Food Vegetable salad	Mechanical Wheels and axles	Textiles Templates and joining techniques
Year 1 and 2 Year B By the end of KS1, children will have the following knowledge:	Food Fruit Smoothies	Mechanical Sliders and Levers	Structures Freestanding weight bearing bridges

Year 3 and 4 Year A By the end of LKS2, children will have the following knowledge:	Mechanical Levers and linkages	Electrical Systems Simple circuits and switches	Food Healthy and varied diet
Year 3 and 4 Year B By the end of LKS2, children will have the following knowledge:	Textiles 2D shape to 3D product	Structures Shell structures	Food Healthy and varied diet
Year 5 and 6 Year A By the end of UKS2, children will have the following knowledge:	Mechanical Cams	Food Celebrating culture and seasonality	Electrical Systems Monitoring Control
Year 5 and 6 Year B By the end of UKS2, children will have the following knowledge:	Textiles Combining different fabric shapes	Food Celebrating culture and seasonality	Structures Frame structures

Early Years	Prior Knowledge	Technical Knowledge	Knowledge of Skills	Next Steps	Assessment
Textiles – Christmas stocking Food – Fruit Kebab Food – Vegetable Kebab Structures – Create something that the children have to design, make and evaluate.		Know how cut using a pair of scissors. Know the vocabulary: Plan, draw, ideas, design, make, build, join, shape, tools, complete, product, final, change, like, dislike, next time, different.	DESIGN Know what they want to make and talk about it. Know they can choose the resources they need for their chosen activities. Know what they have learnt about media and materials and relate to uses and purposes. **Know the importance for good health of a healthy diet.** MAKE Know how to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Know how to concentrate and keep trying if they encounter difficulties. EVALUATE		

			Know how to represent their own ideas, thoughts and feelings through design and technology Know they can be excited about what they have made and say what they like about it.		

	Prior Knowledge	Technical Knowledge	Knowledge of Skills	Next steps	Assessment
Year 1-2 Structures – Three Billy Goats Gruff (Free standing weight bearing bridge) Mechanical Systems – moving thank you card for Father Christmas (Sliders and levers) Mechanical systems – wheelie trolley for Cinderella's glass slipper (wheels and axles) **Food – Fruit smoothies** **Food – vegetable salad** Textiles – placemats (Templates and joining techniques)	DESIGN Know what they want to make and talk about it. Know they can choose the resources they need for their chosen activities. Know the importance for good health of a healthy diet. Know what they have learnt about media and materials and relate to uses and purposes. MAKE Know how to safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Know how to concentrate and keep trying if they encounter difficulties. EVALUATE Know how to represent their own ideas, thoughts and feelings through design and technology Know they can be excited about what they have made	STRUCTURES - Know how to build structures, exploring how they can be made stronger, stiffer and more stable STRUCTURES - Know the vocabulary: cut, fold, join, fix structure, wall, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved, metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder MECHANICAL SYSTEMS - Know how to explore and use mechanisms (sliders, levers, wheels and axles) in their products. MECHANICAL SYSTEMS - Know the vocabulary: slider, lever, pivot, slot, bridge/guide, card, masking tape, paper fastener, join, pull, push, up, down, straight, curve, forwards,	DESIGN Know how to generate ideas by drawing on their own and other people's experiences. Know how to develop their design ideas through discussion, observation, drawing and modelling. Know how to identify a purpose for what they intend to design and make. Know how to identify simple design criteria. Know how to make simple drawings and label parts. **Know that all food comes from plants or animals.** **Know that food has to be farmed, grown elsewhere (e.g. home) or caught.** MAKE Begin to know how to select tools and materials; use vocab' to name and describe them.	DESIGN Know how to generate ideas, considering the purposes for which they are designing. Know how to make labelled drawings from different views showing specific features. Know how to 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. Know how to evaluate products and identify criteria that can be used for their own designs. **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.**	

	and say what they like about it.	backwards, fix, wind up, wheel, axle, chassis. FOOD - Know the vocabulary: fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, healthy, unhealthy, preference, improve, future, original, toasting times, amount, spreading technique, change TEXTILES - Know the vocabulary: wadding, needles, thread, tools, fabrics and components, template, join, decorate, finish, running stitch.	Know how to measure, cut and score with some accuracy. Know how to use hand tools safely and appropriately. Know how to assemble, join and combine materials in order to make a product. Know how to choose and use appropriate finishing techniques **Know how to follow safe procedures for food safety and hygiene.** **Know how to name and sort foods into the five groups.** **Know that everyone should eat at least five portions of fruit and vegetables every day.** **Know how to use techniques such as cutting, peeling and grating.** EVALUATE Know how to evaluate against their design criteria.	MAKE Know how to select appropriate tools and techniques for making their product Know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. Know how to join and combine materials and components accurately in temporary and permanent ways Know how to sew using a range of different stitches, weave and knit. Know how to measure, tape or pin, cut and join fabric with some accuracy. Know how to use simple graphical communication techniques. **Know how to prepare and cook a variety of predominantly savoury dishes**	

			Know how to evaluate their products as they are developed, identifying strengths and possible changes they might make. Know how to talk about their ideas, saying what they like and dislike about them.	**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.** **Know that to be active and healthy, food and drink are needed to provide energy for the body.** EVALUATE Know how to evaluate their work both during and at the end of the assignment. Know how to evaluate their products carrying out appropriate tests.	

	Prior Knowledge	Technical Knowledge	Knowledge of Skills	Next Steps	Assessment
Year 3-4 Textiles – Swimming bag (2D Shape to a 3D product) Electrical Systems – Night light (simple circuits and switches) Structures – Packaging for a gift (shell structures) Mechanical Systems – Greetings cards (Levers and linkages) **Food – Bread based product with filling (Healthy and varied diet)** **Food – Vegetable soup (Healthy and varied diet)**	DESIGN Know how to generate ideas by drawing on their own and other people's experiences. Know how to develop their design ideas through discussion, observation, drawing and modelling. Know how to identify a purpose for what they intend to design and make. Know how to identify simple design criteria. Know how to make simple drawings and label parts. **Know that all food comes from plants or animals.** **Know that food has to be farmed, grown elsewhere (e.g. home) or caught.** MAKE Begin to know how to select tools and materials; use vocab' to name and describe them. Know how to measure, cut and score with some accuracy.	STRUCTURES - Know how to apply their understanding of how to strengthen, stiffen and reinforce more complex structures. STRUCTURES - Know the vocabulary: structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, decision, MECHANICAL SYSTEMS - Know how to use mechanical systems in their products (linkages/levers) MECHANICAL SYSTEMS - Know the vocabulary: mechanism, lever, linkage, pivot, slot, bridge, guide system,	DESIGN Know how to generate ideas, considering the purposes for which they are designing. Know how to make labelled drawings from different views showing specific features. Know how to 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. Know how to evaluate products and identify criteria that can be used for their own designs. **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.**	DESIGN Know how to generate ideas through brainstorming and identify a purpose for their product. Know how to draw up a specification for their design. Know how to 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. Know how to use results of investigations, information sources, including ICT when developing design ideas. Know how to communicate their ideas through detailed labelled drawings. Know how to develop a design specification. Know how to explore, develop and communicate aspects	

	Know how to use hand tools safely and appropriately. Know how to assemble, join and combine materials in order to make a product. Know how to choose and use appropriate finishing techniques **Know how to follow safe procedures for food safety and hygiene.** **Know how to name and sort foods into the five groups.** **Know that everyone should eat at least five portions of fruit and vegetables every day.** **Know how to use techniques such as cutting, peeling and grating.** EVALUATE Know how to evaluate against their design criteria. Know how to evaluate their products as they are developed, identifying strengths and possible changes they might make. Know how to talk about their ideas, saying what	input, process, output linear, rotary, oscillating, reciprocating ELECTRICAL SYSTEMS - Know how to use electrical systems in their products (series circuits incorporating switches, buzzers) ELECTRICAL SYSTEMS - Know the vocabulary: series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device FOOD - Know the vocabulary: ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy,	MAKE Know how to select appropriate tools and techniques for making their product Know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. Know how to join and combine materials and components accurately in temporary and permanent ways Know how to sew using a range of different stitches, weave and knit. Know how to measure, tape or pin, cut and join fabric with some accuracy. Know how to use simple graphical communication techniques. **Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically**	of their design proposals by modelling their ideas in a variety of ways. Know how to plan the order of their work, choosing appropriate materials, tools and techniques. **Know that seasons may affect the food available.** **Know how food is processed into ingredients that can be eaten or used in cooking.** MAKE Know how to select appropriate materials, tools and techniques. Know how to measure and mark out accurately. Know how to use skills in using different tools and equipment safely and accurately. Know how to cut and join with accuracy to ensure a good finish. Know how to select appropriate tools,	

	they like and dislike about them.	intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble TEXTILES - Know the vocabulary: hand-made, machine made, fabric, names of fabrics, fastening, button, Velcro, drawstring, structure, finishing technique, strength, weakness, templates, stitch, seam, seam allowance, template	**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.** **Know that to be active and healthy, food and drink are needed to provide energy for the body.** EVALUATE Know how to evaluate their work both during and at the end of the assignment. Know how to evaluate their products carrying out appropriate tests.	materials, components and techniques. Know how to assemble to make working models. Know how to use tools safely and accurately. Know how to construct products using permanent joining techniques. Know how to make modifications as they go along. Know how to pin, sew and stitch materials together create a product. Know how to achieve a quality product. **Know how to weigh and measure accurately (time, dry ingredients, liquids)** **Know how to apply the rules for basic food hygiene and other safe practices *e.g. hazards relating to the use of ovens*** **Know that recipes can be adapted to change the**	

				appearance, taste, texture and aroma. Know that different food and drink contain different substances – nutrients, water and fibre – that are needed for health. EVALUATE Know how to evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. Know how to record their evaluations using drawings with labels. Know how to evaluate against their original criteria and suggest ways that their product could be improved.	

	Prior Knowledge	Technical Knowledge	Knowledge of Skills	Next Steps	Assessment
Year 5-6 Textiles – Hanging stationary organiser (Combining different fabric shapes) Electrical Systems – Electronic toy money box (Monitoring and control) Structures – Small-scale bird hide (Frame structures) Mechanical Systems – Moving toys (cams) **Food – Yeast based bread roll (Celebrating culture and seasonality)** **Food – Make pasta and a**	DESIGN Know how to generate ideas, considering the purposes for which they are designing. Know how to make labelled drawings from different views showing specific features. Know how to 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. Know how to evaluate products and identify criteria that can be used for their own designs. **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.** MAKE Know how to select appropriate tools and	STRUCTURES - Know how to apply their understanding of how to strengthen, stiffen and reinforce more complex structures. STRUCTURES - Know the vocabulary: frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent MECHANICAL SYSTEMS - Know how to use mechanical systems in their products (cams/cogs) MECHANICAL SYSTEMS - Know the vocabulary: gear, rotation, spindle, driver, follower, ratio, transmit, cam, cog, annotated drawings, exploded diagrams, input, process, output, crank ELECTRICAL SYSTEMS - Know how to apply their understanding of	DESIGN Know how to generate ideas through brainstorming and identify a purpose for their product. Know how to draw up a specification for their design. Know how to 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. Know how to use results of investigations, information sources, including ICT when developing design ideas. Know how to communicate their ideas through detailed labelled drawings. Know how to develop a design specification. Know how to explore, develop and communicate aspects of their design proposals by modelling	DESIGN Know how to use research and exploration, such as the study of different cultures, to identify and understand user needs. Know how to identify and solve their own design problems and understand how to reformulate problems given to them. Know how to develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations. Know how to use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses. Know how to develop and communicate design ideas using annotated sketches, detailed plans, 3-D and	

tomato based sauce (Celebrating culture and seasonality)	techniques for making their product Know how to measure, mark out, cut and shape a range of materials, using appropriate tools, equipment and techniques. Know how to join and combine materials and components accurately in temporary and permanent ways Know how to sew using a range of different stitches, weave and knit. Know how to measure, tape or pin, cut and join fabric with some accuracy. Know how to use simple graphical communication techniques. **Know 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,**	computing to program, monitor and control their products. ELECTRICAL SYSTEMS - Know the vocabulary: reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch, light emitting diode (LED), bulb, bulb holder, battery, battery holder, USB cable, wire, insulator, conductor, crocodile clip control, program, system, input device, output device, series circuit, parallel circuit, sensor, sensor activated alarms, computer controlled electronics, debugging, CAD, algorithm, component FOOD - Know the vocabulary: name of products, names of equipment, utensils, pastry, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell,	their ideas in a variety of ways. Know how to plan the order of their work, choosing appropriate materials, tools and techniques. **Know that seasons may affect the food available.** **Know how food is processed into ingredients that can be eaten or used in cooking.** MAKE Know how to select appropriate materials, tools and techniques. Know how to measure and mark out accurately. Know how to use skills in using different tools and equipment safely and accurately. Know how to cut and join with accuracy to ensure a good finish. Know how to select appropriate tools, materials, components and techniques.	mathematical modelling, oral and digital presentations and computer-based tools. MAKE Know how to select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture. Know how to select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties. EVLAUATE Know how to analyse the work of past and present professionals and others to develop and broaden their understanding. Know how to investigate new and emerging technologies. Know how to test, evaluate and refine	

	spreading, kneading and baking. **Know that a healthy diet is made up from a variety and balance of different food and drink.** **Know that to be active and healthy, food and drink are needed to provide energy for the body.** EVALUATE Know how to evaluate their work both during and at the end of the assignment. Know how to evaluate their products carrying out appropriate tests.	preference, greasy, moist, cook, fresh, savoury, hygienic, edible, consumer, processed, seasonal, harvested healthy/varied diet, construction, design, TEXTILES - Know the vocabulary: seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces, name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings.	Know how to assemble to make working models. Know how to use tools safely and accurately. Know how to construct products using permanent joining techniques. Know how to make modifications as they go along. Know how to pin, sew and stitch materials together create a product. Know how to achieve a quality product. **Know how to weigh and measure accurately (time, dry ingredients, liquids)** **Know how to apply the rules for basic food hygiene and other safe practices *e.g. hazards relating to the use of ovens*** **Know that recipes can be adapted to change the appearance, taste, texture and aroma.**	their ideas and products against a specification, taking into account the views of intended users and other interested groups. Know how to understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists. TECHNICAL KNOWLEDGE Know how to use the properties of materials and the performance of structural elements to achieve functioning solutions. Know how more advanced mechanical systems used in their products enable changes in movement and force. Know how more advanced electrical and electronic systems can	

			Know that different food and drink contain different substances – nutrients, water and fibre – that are needed for health. EVALUATE Know how to evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. Know how to record their evaluations using drawings with labels. Know how to evaluate against their original criteria and suggest ways that their product could be improved.	be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]. Know how to apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]. FOOD and NUTRITION: Know how to apply the principles of nutrition and health. Know how to cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet. Know how to become competent in a range of cooking techniques	

				[for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes]. Know the source, seasonality and characteristics of a broad range of ingredients.	