



Design Technology Overview

Our Mission Statement for Design Technology (the INTENT):

The world around us is full of amazing designs; many of which quite rightly fill us with awe and wonder and we place our **trust** in every day. At Dereham CofE Junior Academy, we want our children to have an inquisitiveness about design and the **creative** confidence and technical competence to solve practical problems.

We want our pupils to study their environments, question the world around them, evaluate past and present designs and technologies, and develop a deep **respect** for how things work the way they do.

We want our pupils to have the **courage** to take risks and to become resourceful, innovative, enterprising and capable citizens able to contribute creatively to society. We believe this can be completed whilst showing responsibility and demonstrating **kindness** for the environment through considering the use of sustainable or recycled materials in their designs and products.

We want our pupils to foster an enjoyment, pride and sense of purpose in designing and making that inspires them today and maybe even develops **aspirations** to work in this field in the future.

The majority of our D&T curriculum is delivered through our cross-curricular topics as opposed to weekly discrete D&T lessons.

		Design and Technology KNOWLEDGE (Declarative – Concepts, Rules, Facts)		BEING a Design Technologist (Procedural – Applying that Declarative Knowledge)		Suggested Special Days, Visits or Calendar Events & Recommended Reads
		Threshold Concept 1: Technical	Threshold Concept 2: Food	Threshold Concept 3: Innovations and Innovators	Threshold Concept 4: Design, Make and Evaluate	
Year 3	Develop and use knowledge of how to construct strong, stiff shell structures.	Know how to use appropriate equipment and utensils to prepare and combine food.	Famous/iconic shell structures: Sydney Opera House Eden Project Millenium Dome, London Sagrada Familia The inventors of the Anderson Shelter: William Paterson and Oscar Carl Kerrison	Design: <ul style="list-style-type: none"> Generate realistic ideas and design criteria through collaborative discussion/or on their own, focused on needs of user and purpose of product (this can include appearance, taste, texture and aroma when working with food) Develop ideas through analysis of existing products Use annotated sketches, prototypes and, where appropriate, information technology to develop, model and communicate ideas Explain choice of materials according to functional properties and aesthetic qualities Use computer-aided design to model and communicate ideas. 	Make: <ul style="list-style-type: none"> Order main stages of making, including when following recipes, listing items and utensils needed Select and use appropriate tools with some accuracy to measure, mark-out, cut, score, shape and assemble Select and use appropriate utensils and equipment to prepare and combine ingredients Select from and use finishing techniques (including computer generated) suitable for the product they are creating Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. 	
	Develop and use knowledge of nets of cubes and cuboids, and where appropriate more complex 3D shapes. Understand and use lever and linkage mechanisms. Distinguish between fixed and loose pivots. Know how to thread a needle, knot thread and sew using a running stitch Know and use technical vocabulary relevant to the project. Vocabulary:	Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. Vocabulary: Names of equipment and utensils: peeler, potato masher, paring knife, utility knife spreading (butter) knife, spatula Names of techniques:				

	<p>Structures: Prototype, design brief, design criteria, proto-type innovative</p> <p>shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, marking out, scoring, recycle, corrugating, ribbing</p> <p>Mechanical systems:</p> <p>prototype, design criteria, design brief mechanism, lever, linkage, pivot, user, purpose, function, guide</p> <p>added loose and fixed Pivot, client, user,</p> <p>Textiles: fabric, stitch, needle, thread, user, purpose, design, evaluate, function,</p>	<p>Peel, mash, chop, cut, combine, mix, bridge and claw hold.</p> <p>texture, taste, sweet, sour, hot, spicy, greasy, moist, cook, fresh, savoury</p> <p>hygienic, allergies/intolerances, grown, reared, frozen, tinned, processed, seasonal,</p>		<p>3 Suggested Projects:</p> <ol style="list-style-type: none"> 1. Shell Structures 2. Mechanical systems – levers and linkages 3. Food 4. Textiles
<p>Year 4</p>	<p>Develop knowledge of how to create a fabric 3D product from fabric 2D shapes.</p> <p>Understand how to join two pieces of fabric using a running or over stitch</p> <p>Know how to sew on a button</p> <p>Understand and use electrical systems in their made products.</p> <p>Apply their understanding of computing to program and control their products.</p> <p>Know and use technical vocabulary relevant to the project –</p> <p>Vocabulary:</p> <p>Electrical Systems: series circuit, fault, connection, toggle switch, push-to-make</p>	<p>Know how to use appropriate equipment and utensils to prepare and combine food.</p> <p>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</p> <p>Vocabulary:</p> <p>Names of products: sandwiches – pinwheel, open</p> <p>Names of equipment and utensils: utility knife, paring knife, peeler, spreading (butter) knife, grater, cutters</p> <p>Names of techniques: Peel, slice, chop, cut, grate, combine, mix, bridge and claw hold.</p>	<p>History of Electricity and light bulbs - Alesandro Volta, Thomas Edison, Humphrey Davy</p>	<p>Design:</p> <ul style="list-style-type: none"> ● Gather information about needs and wants ● Develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups ● Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. <p>Make:</p> <ul style="list-style-type: none"> ● Order the main stages of making including when following recipes, listing items and utensils needed ● Select and use appropriate tools and equipment to cut, shape, join and finish with some accuracy ● Select and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities ● (Program a standalone control box, microcontroller or interface box to enhance the way the product works) ● Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. <p>Evaluate:</p> <ul style="list-style-type: none"> ● Investigate and evaluate existing and their own products and ideas against design criteria and by asking the views of others ● Identify strengths and areas for improvement to their work ● Record their evaluations using tables and simple graphs

	<p>switch, push-to-break switch, battery, battery holder, bulb, bulb holder, LED bulb, wire, insulator, conductor, crocodile clip</p> <p>user, purpose, function, prototype, design criteria, innovative, appealing, design brief</p> <p><i>(When programming has been introduced control, program, system, input device, output device)</i></p> <p>Textiles: fabric, names of fabrics (felt, cotton, denim etc), fastening, button, structure finishing technique, strength, weakness, templates, stitch, seam, seam allowance</p> <p>user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces</p>	<p>Ingredients: bread, margarine/butter, tuna, ham, chicken, tomato, lettuce, spinach, pepper, apple, carrot, spring onion, pesto, wrap, bread, roll, + gluten free alternatives</p> <p>texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, fresh, savoury</p> <p>hygienic, allergies/intolerances, gluten free, dairy free, nut free edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet planning,</p> <p>design criteria, purpose, user, annotated sketch, (sensory) evaluation</p>		<p>3 Suggested Projects:</p> <ol style="list-style-type: none"> Textiles Electrical systems Food
<p>Year 5</p>	<p>Develop knowledge of how a 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</p> <p>Understand that fabrics can be strengthened, stiffened and reinforced</p> <p>Learn how to make a frame structure using straws, construction kits and wood. Know how to design, measure, cut and join wood to create strong structures.</p> <p>Know how to program controlled technology (Crumble) to move an object</p> <p>Know and use technical vocabulary relevant to the project – see project on the page</p> <p>Key vocabulary: Textiles:</p>	<p>Know how to use utensils and equipment including heat sources to prepare and cook food.</p> <p>Understand about seasonality in relation to food products and the source of different food products.</p> <p>Key Vocabulary: ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs</p> <p>nutrients: fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality</p> <p>utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p> <p>design specification, innovative, research, evaluate, design brief</p>	<p>Gustave Eiffel – structural engineer</p> <p>Vehicle chassis</p>	<p>Design:</p> <ul style="list-style-type: none"> Generate innovative ideas by carrying out research through discussion, surveys, interviews and questionnaires. Explore and develop, model and communicate ideas through talking, sketches – annotated/exploded/from different views, templates, mock-ups and prototypes and where appropriate, computer-aided design. Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specifications <p>Make:</p> <ul style="list-style-type: none"> Produce detailed lists of equipment and fabrics relevant to their tasks. Formulate step-by-step plans, including recipes, and, if appropriate, allocate tasks within a team. Select from and use a range of tools, utensils and equipment, including CAD, to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. <p>Evaluate:</p> <ul style="list-style-type: none"> Investigate and analyse pre-made products Compare their own made final product to the original design specification. Test products with intended user (where safe and practical) and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. Consider the views of others to improve their work <p>3 suggested Projects:</p> <ol style="list-style-type: none"> 3D textiles Frame Structures Controlled technology Food

	<p>seam, seam allowance, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles (cotton, denim etc) and fastenings (buttons, toggle) pins, needles, thread, pinking shears, iron design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up/prototype</p> <p>Frame structures: frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief, prototype</p>			
<p>Year 6</p>	<p>Understand how to strengthen, stiffen and reinforce 3-D frameworks.</p> <p>Understand and use electrical systems in their products.</p> <p>Understand the use of computer control systems in products and apply this to monitor and control their own products.</p> <p>Know and use technical vocabulary relevant to the project.</p> <p>Structures: frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional</p> <p>Electrical Systems: series circuit, parallel circuit, names of switches and components, input device,</p>	<p>Know how to use utensils and equipment including heat sources to prepare and cook food.</p> <p>Understand about seasonality in relation to food products and the source of different food products.</p> <p>Vocabulary:</p> <p>ingredients, spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble</p> <p>design specification, innovative, research, evaluate, design brief, cost, budget</p> <p>Added: Peeling, bridge cut, hygiene, consistency, texture, nutritious, cost effective, scale up</p>	<p>Wunderkammer – cabinets of curiosity Museum exhibition design</p>	<p>Design:</p> <ul style="list-style-type: none"> ● Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources to develop a functional product ● Generate, develop and model innovative ideas, through discussion, prototypes, annotated sketches ● Take account of constraints including time, resources and cost ● Communicate ideas through sketches (annotated/exploded/from different views) and pictorial representations <ul style="list-style-type: none"> - electrical circuits or circuit diagrams. <p>Make:</p> <ul style="list-style-type: none"> ● Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. ● Competently select and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make reliable functional products ● Use finishing and decorative techniques suitable for the product they are designing and making. ● Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. ● Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment <p>Evaluate:</p> <ul style="list-style-type: none"> ● Investigate and evaluate a range of existing products. ● Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. ● Take account of the views of other to identify areas for further improvements ● Record evaluations using tables/graphs/charts etc <p>3 Suggested Projects:</p> <p>1. Structures – 3D frameworks</p>

output device, system, monitor,
control, program, flowchart
function, innovative, design
specification, design brief, user,
purpose
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
function, innovative, design
specification, design brief,

2. Electrical systems controlled by computer programming

3. Food