

Purpose of Study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook

Key Stage 1 content:

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].

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.

Key Stage 2 content:

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].

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.

To be working at '**EXPECTED**' in DT ...

ELG:	Year 1:	Year 2:
<ul style="list-style-type: none"> • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function 	<ul style="list-style-type: none"> • To use vocabulary and correct terminology to describe what they have done. • Evaluate an existing product can explain how it has been made. • To generate and draw their own idea. • They can draw, mark, cut, glue and paint a product. • They can choose materials, investigate effects and explain their choices. • Identify where food comes from. • Can design a healthy meal • Identify basic hygiene • Explain and understand how simple mechanisms (wheels and levers) work • Build simple structures from provided materials 	<ul style="list-style-type: none"> • Children evaluate how a product is made and identify the audience it was made for. • Uses higher order thinking and vocabulary to describe a product and how it's made. • They can generate ideas and draw them, including annotating with labels to show the correct parts. • They can evaluate their own product and how they would modify it to make improvements. • They know that food (e.g. fruit) can be found in other foods (e.g. like yoghurt) • Choose the best tools and materials to build a product. • Design using labelled diagrams • Children build a prototype • Children can create a set of success criteria • Children can explain/describe how their product works • They can use simple stitches to attach pieces of materials together. • They can re-inforce a simple structure. • They can build a model with a simple mechanism. • Children can explain the origins of common processed food (like pasta or bread)

To be working at '**GREATER DEPTH**' in DT ...

ELG:

- Children develop their own ideas through selecting and using materials and working on processes that interest them. Through their explorations they find out and make decisions about how media and materials can be combined and changed.
- 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.
- Children talk about the ideas and processes which have led them to make music, designs, images or products. They can talk about features of their own and others work, recognising the differences between them and the strengths of others.

Year 1:

- Children work confidently within a range of contexts.
- They state which products they are designing and making.
- Children describe what their products are and how they will work.
- Children generate their own ideas by drawing on their own experiences.
- They develop and communicate ideas by talking and drawing
- Children select from a range of tools, materials and components, according to their characteristics and explain those choices.
- Children make simple judgements about their products against design criteria.
- Children explore what products are, what they are made from, who they are made for and how/where they are used.

Year 2:

- Children work confidently and imaginatively within a range of contexts.
- Children describe what their products are for and their purpose; saying how they will work and how they're suitable for intended users.
- Children generate their ideas by drawing on their own experience and using knowledge of existing products.
- Children accurately measure, mark out, cut and shape a range of materials, which they assemble, join and combine with their components.
- Children can talk and write about how to make their product better.
- They refer to their design criteria as they design and make.
- Children know about the movement of simple mechanisms such as levers, sliders, wheels and axels.
- They understand how freestanding structures can be made stronger, stiffer and more stable.

National curriculum expectations	EYFS	Year 1	Year 2
<p>Across all year groups: Design purposeful, functional, appealing products for themselves and other users based on design criteria This will include:</p> <ul style="list-style-type: none"> • Comparing products – identifying the purpose they were built for and/or where the idea came from (including historical, cultural or social) • De-constructing and re-building models • Creating prototypes to test <u>and evaluate</u> • <u>Amending</u> design briefs based on research to inform the final design • Using sketch books to build up a bank of designs and ideas 			
<p>Design Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p>	<ul style="list-style-type: none"> • Draw and then talk about what they've drawn. • Evaluate – adapts work where necessary 	<ul style="list-style-type: none"> • Use pictures and words to describe what I want to do • Describe how a product works • Evaluate - explore and evaluate a range of existing products • Evaluate- Evaluate their ideas and products against design criteria 	<ul style="list-style-type: none"> • Use models, pictures and words to describe my designs • Use art skills to add design or detail to my product • Evaluate - explore and evaluate a range of existing products • Evaluate- Evaluate their ideas and products against design criteria
<p>Make – TEXTILES Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</p>	<ul style="list-style-type: none"> • Technical skills – gluing and sticking, cutting to make collaged pictures 	<ul style="list-style-type: none"> • Measure, mark out and cut fabric • Join fabrics using glue • Alter a textile to make it stronger • Sort threads and fabrics. • Make weavings with fabrics or threads. • Cut, roll and coil materials 	<ul style="list-style-type: none"> • Use accurate measurements in cm • Join textiles using glue, staples, tying or a simple stitch • Explore plaiting and understand the basic method
<p>Make – 3D MODELLING Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</p>	<ul style="list-style-type: none"> • Junk modelling – how to use tape to join materials 	<ul style="list-style-type: none"> • Use clay, dough and plasticine • Add texture to models using tools • Make shapes from rolled up paper, straws, paper and card 	<ul style="list-style-type: none"> • Make clay pot • Carve patterns and shapes using dry clay • Dip dye to produce fabric of contrasting colours

<p>Make – STRUCTURES Select from and use a wide range of materials and components, including construction materials, according to their characteristics</p>	<ul style="list-style-type: none"> • Constructs with a purpose in mind using a variety of resources. • Construction toys – lego, duplo, stickle bricks, blocks to join, make balance and contrast with a purpose. • Selects tools and techniques needed to shape, assemble and join materials. 	<ul style="list-style-type: none"> • Measure and mark out the materials I need for my structure • Finish off my work so it looks neat and tidy • Make a product that moves using a turning mechanism (e.g. wheels, winding) 	<ul style="list-style-type: none"> • Measure and mark out materials with care and use safe ways of cutting it, including using a junior hacksaw • Know how to make structures stronger by folding joining or by shape (columns, triangles). • Use a range of joins • Make a product that uses lever or a hinge (to make a movement)
<ul style="list-style-type: none"> • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from 	<p>In all cooking activities children must be taught:</p> <ul style="list-style-type: none"> • to make healthy eating choices from and understanding of a balanced diet • to select their own ingredients for a food product • to work in a safe and hygienic way • to measure out my ingredients by weight or quantity, using scales where appropriate • to present a food product in a way to impress the intended user. • to explain how and why different food types need to be stored differently 		
<p>Evaluate their ideas and products against design criteria</p>	<ul style="list-style-type: none"> • Understands the need for a variety in food • Know the importance of making healthy diet choices 	<ul style="list-style-type: none"> • Identify healthy and unhealthy food • Cut, chop, mix, spread and grate • Know some food comes from plants and some from animals 	<ul style="list-style-type: none"> • Prepare and cook two simple healthy dishes • Use a cooker, hob and microwave to heat food (with adult supervision) • Know origins of common processed food e.g. bread, pasta, yoghurts, sugar, chocolate
<p>Cross curricular</p>	<p>Evaluation needs to be built in at ALL stages of a DT project – designing, making and at the end of a project.</p> <ul style="list-style-type: none"> • Children compare ideas, methods and approaches in their own and others' work and say what they think and feel about them. • This includes appraising designer's work; explaining imagination of their own ideas; evaluating their own work and identifying next steps; evaluating the work of peers, using the language of feedback. • Children will use the appropriate Tower Hamlets language of evaluation and comparison for their year group. • The Austin's butterfly approach of reviewing and re-drafting designs. 		

To be working at 'EXPECTED' in DT ...

Year 3:	Year 4:	Year 5:	Year 6:
<ul style="list-style-type: none"> • Children show that their design meets a range of requirements. • Children accurately annotate a diagram of a product to show materials and parts. • Children can explain their choices using conjunctions such as 'because' • Children explain and describe in detail how their product works. • They plan ideas from existing products (with independent research) • Children explore/compare a range of products/ materials giving simple explanations for why they're fit for purpose. • Designs are labelled diagrams and simple cross sections • They can identify the steps needed to make a product • They can identify strengths and weaknesses in their own, and others (including existing) products • They explore different materials and explain how the features are beneficial to their design. • They can identify the main food groups and what they provide for the body. • Children can embroider patterns, use running stitch and sew buttons • They can explain the parts of a circuits • Bench hooks, hack saws and punches are used safely and with accuracy. 	<ul style="list-style-type: none"> • Children select materials appropriate for purpose (independently) – providing justification for their choices. • Children apply existing knowledge to explain why strengths and weaknesses exist and justify improvements. • When studying a key figure, the children can explain their impact on history and plot simple technological advances from a given time period. • Children research and develop products fit for purpose (explain aesthetics) • They explain and justify realistic ideas to achieve designs. • They identify and explain risk factors for different tools. • Simple knives (craft and kitchen) and glue guns can be used with support • They use electrical systems, series circuits, switches, buzzers and motors. • They describe a balanced diet – including texture and flavour. • Explanation of how diet varies between the ages and sexes. • They know how to look after plants for optimum growth. • Children can explain about the safe storage of different types of food • Fastenings can be attached with different stitches and decoration techniques improve the aesthetics of a product. • Materials are joined with temporary and then permanent fastenings. 	<ul style="list-style-type: none"> • Children can practically solve problems with products based on their weaknesses and justify these changes. • They can write a design brief. • They can draw plan, end and side-view diagrams with annotations of terminology and dimensions. • They choose the best and most appropriate material from success criteria. • They investigate different circuit possibilities. • They research existing products, independently identifying key features. • They create products for a specific audience and/or purpose • They test models and identify what is essential for success • They select and use tools from a given selection, discussing health and safety and hygiene. • They can describe gears and pulleys • Design and cook a meal fit for purpose. • They can calculate air miles, discuss fair trade and independently cut and prepare ingredients for a meal • They can explain the specific dietary requirements of different faiths/cultures 	<ul style="list-style-type: none"> • They test models and identify what is essential for success – suggesting improvements. • They use expanded diagrams • They can explain the impact/cause and consequence of health and safety • They evaluate their own and others work by asking their own questions. • They can explain the impact an important figure has had on wider society. • They can independently design a mean for different groups of people. • Children explain why certain materials and tools are needed to meet an objective • Use tools and follow methods independently • They can explain the origins (including inventor) of the original product • Use CAD to generate ideas and designs for a product. • Children use exploded diagrams to explain and show how something works. • Children can explain the mechanics of a CAM. • Models are controlled by computers. • They explain how each food group is used by the body and use this to justify choices when designing a daily/weekly menu • Environmental issues with food production are explained and possible solutions justified with research.

To be working at '**GREATER DEPTH**' in DT ...

Year 3:	Year 4:	Year 5:	Year 6:
<ul style="list-style-type: none"> • Children describe the purpose of their products and indicate their design features. • Children gather information about the needs and wants of individuals and groups to develop their own design criteria. • They confidently share and clarify ideas through discussion – using annotated sketches and diagrams to communicate ideas. • After joining and combining materials and components, they apply finishing techniques. • They investigate and analyse: how well products have been designed and made; why materials were chosen; what method of construction was used; whether they achieved their purpose and the needs/wants of the user. • They consider the views of others, included intended users, to improve their work. • Children recognise successful inventors, designers, chefs and engineers who have been influential in the design and technology industries. • They apply science and mathematics to help design and make products that work. 	<ul style="list-style-type: none"> • Children describe in depth the purpose of their products – indicating design features that will appeal to intended users. • Children carry out research to identify users' needs/wants and then gather appropriate information. • Children develop their own design criteria and use this to inform their ideas. • They use annotated sketches and some cross-sectional drawings to develop and communicate realistic ideas, focusing on the needs of the users. • Children confidently select tools and equipment suitable to the task – explaining these choices using evidence. • Children use science, maths and learning from other subjects to design and make products that work – including understanding that materials have functional and aesthetic qualities. • Children begin to consider cost and sustainability. • Children can consider the impact and innovative qualities that successful inventors, designers, chefs, manufacturers and engineers' products have had. 	<ul style="list-style-type: none"> • Children describe in detail the purpose of their products. • They use research, surveys, questionnaires, interviews and web-based resources to identify users' needs, wants and preferences. • They create a design specification to guide their thinking. • Ideas are modelled through prototypes, pattern pieces, annotated sketches, cross-sectional and exploded diagrams and CAD packages that take account of the availability of resources. • Children accurately apply a range of finishing techniques, including those from art. • Children can explore and comment on the impact and innovative qualities of their own products. • Children know how mechanical systems (levers, cams, pulleys or gears) create movement and electrical circuits and components create functional products. They can programme a computer to control their products. 	<ul style="list-style-type: none"> • Children describe in detail the purpose of their products – beginning to consider the influence of a range of lifestyle factors and consumer choices. • Children develop detailed design specifications to guide their thinking and planning – beginning to solve their own design problems. • Children make informed design decisions based on time, cost and resource constraints. They use a variety of approaches to generate creative ideas. • Children can use an extensive range of more complex materials and components. • Children critically evaluate the quality of the design manufacture and fitness of purpose of products they've built – actively involving others in the testing process. • Children consider the positive and negative impact that products can have on the wider world.

National curriculum expectations	Year 3	Year 4	Year 5	Year 6
<p>Across ALL year groups: Use research to develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. This will include:</p> <ul style="list-style-type: none"> • Comparing products – identifying the purpose they were built for and/or where the idea came from (including historical, cultural or social) • De-constructing and re-building models using knowledge of joins, types of bonds and structural knowledge • Creating prototypes to test and evaluate • Amending design briefs based on research to inform the final design • Using sketch books to build up a bank of designs and ideas 				
<p>Design Generate, develop, model and communicate their ideas through discussion; annotated sketches; cross-sectional and exploded diagrams; prototypes; pattern pieces; and CAD</p> <p>Evaluate Investigate and analyse a range of existing products</p>	<ul style="list-style-type: none"> • Design an object and label the materials • Know the difference between a sketch and a cross section • Plan a sequence of actions to make a product • Evaluate: identify the strengths and weaknesses of design ideas and decide which one is best to develop 	<ul style="list-style-type: none"> • Draw plan and side views of my design • Ask people opinions on a product and draw a conclusion • Develop more than one design or adaptation of an initial design • Evaluate: explain why building a prototype is useful and why they've adapted plans during the making process 	<ul style="list-style-type: none"> • Draw a diagram from a plan, end and side view • Draw plans which can be read/followed by someone else • Models, kits and drawings to help formulate design ideas • Evaluate: explain how a project will need to be adapted during construction and say if it meets the design brief 	<ul style="list-style-type: none"> • Use CAD (computer aided design). • Create Haynes style exploded diagrams to explain and show how something works • Give a report using correct technical vocabulary • Evaluate: use a prototype to experiment with new ideas during construction and alter a design brief
<p>Make - TEXTILES Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities</p>	<ul style="list-style-type: none"> • Sew on a button • Use embroidery to make a pattern • Thread a needle and use running stitch • Colour fabric and have used this to add pattern 	<ul style="list-style-type: none"> • Combine materials to add strength or visual appeal using running or back stitch, over sewing • Explore fastenings and recreate some • Allow seam allowance • Use appropriate decoration techniques e.g. appliqué (glued or simple stitches) • Create texture by tying and sewing threads or by pulling threads 	<ul style="list-style-type: none"> • Mark out using my own patterns and templates • Experiment with batik techniques • Use the techniques of sewing (cross stitch & backstitch) appliqué, embroidery, plaiting, finger knitting and combine some to create hangings. 	<ul style="list-style-type: none"> • Experiment with a range of media to overlap and layer creating interesting colours and textures and effects • Use a range of joining techniques with fabrics (stitching to hold materials, embroidery to decorate, WonderWeb to join fabrics permanently)

BLACK PEAR TRUST – SUBJECT PLAN - DT

<p>Make – MOULDABLE MATERIALS (incl. clay) Select from and use a wider range of materials and components, including construction materials, according to their functional properties and aesthetic qualities</p>	<ul style="list-style-type: none"> Models on a range of scales communicate observations from the real or natural world Products are shaped carefully, using techniques and tools that lead to a high quality finish Use art skills to apply texture or design to a product 	<ul style="list-style-type: none"> 3D work has a well thought out purpose Use the technique of adding materials to create texture, feeling, expression or movement. (e.g wrinkles on a portrait sculptures) 	<ul style="list-style-type: none"> Use carvings to a surface to create shapes, texture & pattern Use both hands and other tools to mould materials into very accurate shapes that'll do the intended job Apply a high quality finish (e.g. using carving, paint, glaze, varnish or other finishes) 	<ul style="list-style-type: none"> Use a variety of tools and techniques for sculpting in clay, paper-mache and other mouldable materials
<p>Make - STRUCTURES Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p>	<ul style="list-style-type: none"> Use scoring, and folding to shape materials accurately I choose tools appropriately: <ul style="list-style-type: none"> Scissors Glue sticks Bench hooks Hacksaw 	<ul style="list-style-type: none"> Use lolly sticks/card to make levers and linkages Use linkages to make movement larger or more varied Join materials to make products using both permanent and temporary fastenings I can use: <ul style="list-style-type: none"> A range of scissors Simple knives (craft and kitchen) Bench hook Saw Rulers Glue gun (1:1 help) 	<ul style="list-style-type: none"> Explore paper techniques such as pop- up books and origami Add paper curlings or other objects to a surface to embellish Mark out using their own patterns and templates Use: <ul style="list-style-type: none"> Glue guns Saw Set squares Bench hooks Drills/punches Needles and thread Tape measures 	<ul style="list-style-type: none"> Measure and select materials with cost and workability in mind Make very careful and precise measurements so that joins, holes and openings are in exactly the right place Ensure that edges are finished by sometimes adding other materials. (e.g. edging strips) Explain the mechanical workings of a CAM Use: <ul style="list-style-type: none"> Yr 5 equipment Screwdrivers and hammers Choose the correct tools and equipment for the project, taking account of basic health and safety

BLACK PEAR TRUST – SUBJECT PLAN - DT

<ul style="list-style-type: none"> • 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. 	<p>In all cooking activities children must be taught:</p> <ul style="list-style-type: none"> • to make healthy eating choices from and understanding of a balanced diet • to select their own ingredients for a food product • to work in a safe and hygienic way • to measure out my ingredients by weight or quantity, using scales where appropriate • to present a food product in a way to impress the intended user. • to explain how and why different food types need to be stored differently 			
<p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p>	<p>Evaluation needs to be built in at ALL stages of a DT project – designing, making and at the end of a project.</p> <ul style="list-style-type: none"> • Children compare ideas, methods and approaches in their own and others' work and say what they think and feel about them. This includes appraising designer's work; explaining imagination of their own ideas; evaluating their own work and identifying next steps; evaluating the work of peers, using the language of feedback. • Children will use the appropriate Tower Hamlets language of evaluation and comparison for their year group. • The Austin's butterfly approach of reviewing and re-drafting designs. 			
<p>Cross curricular</p>	<ul style="list-style-type: none"> • Understand how key events and individuals in design and technology have helped shape the world • Explain the benefits and advantages of Fair Trade • Calculate air miles and begin to calculate profit on products • Apply my knowledge of food chains and diets to the food that enters our food chain • Discuss the environmental issues over growing seasons (e.g. GM crops for 3rd World countries, poly tunnels in the countryside, impact of pesticides) and explain food lakes and mountains and offer solutions 			
	<ul style="list-style-type: none"> • Recognise basic food groups • Explain the eat well plate • Develop sensory vocabulary/knowledge using, smell, taste, texture and feel • Explain the differences between sweet and savoury 	<ul style="list-style-type: none"> • Analyse the taste, texture, smell and appearance of a range of foods • Describe food products in terms of taste, texture, flavour and relate this to its intended purpose • Create a product that needs to be cooked or chilled to change the nature of the raw ingredients 	<ul style="list-style-type: none"> • Explain the basic food groups • Explain the specific dietary requirements of different faiths and cultures and take this into account when designing • Join and combine food ingredients appropriately e.g. beating, rubbing in; decorate appropriately 	<ul style="list-style-type: none"> • Explain how each food group is used by the body explain how lifestyle or medical factors affect diet • Understand social influences on the food we choose to eat (eg media, peer pressure, ethics) • Select and prepare foods for a particular purpose. Cut and shape ingredients using appropriate tools and equipment e.g. grating