Design and Technology: Progression of Learning

<table>
<tr><th colspan="2">Opportunities for design and technology in EYFS
Children's learning in D&T should include planned, purposeful play and both child initiated and adult-led activities.</th></tr>
<tr><td>Area of Learning</td><td>By the end of the EYFS</td></tr>
<tr><td>Communication and Language</td><td>• Listen carefully to instructions and follow them accurately when using tools and practising techniques.
•Explain how their own and others' products work,
•Say who they think they are for and what purposes they fulfil.
•Develop technical vocabulary and learn how to express their ideas for what they want to design and make.</td></tr>
<tr><td colspan="2">In the Provision:
•Use the correct technical terms specific for tools and materials.
• Have materials in different categories based on their properties e.g. optical properties such as opaque, translucent and transparent, materials that can bend, be folded etc.
• a range of non-fiction books related to machines, vehicles, buildings etc.
• Graphical instructions such as building block instructions</td></tr>
<tr><td>Personal, Social and Emotional Development</td><td>• Show resilience and perseverance in the face of challenge.
• Manage their own needs.</td></tr>
<tr><td colspan="2">In the Provision:
• Children work collaboratively on design and make tasks.
• Begin with simple tools that can be used one-handed (e.g. sandpaper block) and allow them to experience a range of tools, and those that require 2 hands too (e.g. twist drill).
• Some aspects of (low) risk situations to help develop self-esteem e.g. use a hammer to drive a nail under supervision.
• Understand risks and what we do to reduce them, for example, wearing goggles. This will help to develop self-care.
• When designing and/or making things for other people, children talk about what they think the user would like/need.
• Develop problem-solving skills by talking through how they, you and others resolved a problem or difficulty. Show that mistakes are an important part of learning and going back is trial and error not failure.
• Highlight the importance of eating plenty of fruits and vegetables at the snack area</td></tr>
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Physical Development	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons.
In the Provision: •Threading and sewing, woodwork, pouring, stirring, making models with junk materials, construction kits and malleable materials like clay. • Using small tools help to develop precision • Exploring different fastenings such as zips, press-studs, Velcro, toggles, nuts and bolts on product handling collections. • Wooden boards with holes in can accommodate a number of different fixings such as hex nuts, screws and nails. Where possible introduce tools too such as allen keys, stubby screwdrivers and hammers. • Soft surfaces for using hammers and nails, for example, polystyrene, golf tees cork make the process easier. • Workshop area with wood, sandpaper and saw, clamps and jigs to hold items in place as children cut and assemble.	
Literacy	• Use some of their print and letter knowledge in their early writing.
In the Provision: • Write what they have designed and made through captions, labels, simple descriptions and explanations. • non-fiction books relating to machines, buildings, products, factories • Label design and technology resources in the classroom	
Mathematics	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns. • Compare length, weight and capacity.

In the Provision:

- Construction materials and kits feature a range of different shaped items.
- Manipulation of different materials such as plasticine, sheet materials such as card into different shapes.
- Use a range of units of measure, both standard and non-standard.
- Set challenges that require measures e.g. a bridge that needs to hold 3 cups of sand.
- Provide opportunities to measure when creating products as well as using estimation and comparison.
- Weigh ingredients when following a recipe.
- Predict when creating objects and experiment with making small adjustments e.g. moving axle positions, wheel sizes and testing e.g. see which goes furthest/fastest.
- Disassembling packaging to explore 2D and 3D shapes.
- Estimate lengths of screws and/or nails needed, which spanner is required for the nut?

Understanding the World	• Talk about what they see, using a wide vocabulary. • Explore how things work. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice. • Explore the natural world around them.

In the Provision:

- Explore existing products - include those made from textiles, food and construction materials. They can feature everyday (but unusual) items and some with moving parts e.g. hand whisk.
- Explore products designed for different users and purposes.
- A product handling collection to:
  - ask questions about who the products are for and what they do;
  - think about the materials that have been used and how the products have been made;
  - say what they like or dislike about the design of the products;
  - talk about how the products look, feel and smell and explain how they work.
- A material handling collection to:
  - handle and suggest what they may be useful for, based on their properties;
  - have a range of feature materials with different properties e.g. opaque, translucent and transparent plastics, magnetic and non-magnetic metals, stretchy, rough, smooth and soft fabrics.
- Explore aspects of the designed and made world through the indoor and outdoor environment
- Disassemble items e.g. broken toaster
- Explore materials and where they come from – wood from trees, sawdust when sanded.

<table>
<tr><td colspan="2">• Recycling bins in your class and get children to sort into different materials.
• Talk about 'important members of society' to other professions such as plumbers and architects.</td></tr>
<tr><td>Expressive arts and design</td><td>• Return to and build on their previous learning, refining ideas and developing their ability to represent them.
• Create collaboratively, sharing ideas, resources and skills.</td></tr>
<tr><td colspan="2">In the Provision:
• Develop different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.
• Provide a range of materials and tools and teach children to use them with care and precision.
• Promote independence, introducing new techniques when appropriate
• Children to think about who and what their product is for e.g. fruit drink for a party.
• Function – make sure that children have opportunities to create products that have to work in some way in order to be successful e.g. using a construction kit, make a wall strong and stable enough for Humpty Dumpty.
• Aesthetics – children to think about the appearance, finish and texture of the product e.g. decorative effects used on a simple felt bag to suit the user.
• Be able to select media and materials
• Explore characteristics of materials including food, textiles and construction materials using their senses
• They need frequent opportunities to play with and explore a range of large and small construction kits that use different forms of joining e.g. magnetic, slot together, stacking etc.
• They should also frequently explore materials that can be used to make things, such as felt, cardboard, softwood, plastics etc
• Construction kits:
- allow children to build towers, walls, frameworks and shell structures;
- Encourage children to think how they can stop their structures from falling over and how to make them stronger.
- include moving parts such as wheels, levers and hinges.
• Children may retrospectively draw what they have made.
• Designing includes physically arranging and re-arranging materials and components and orally communicating what they are doing and have done.
• Design as they make.</td></tr>
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Food and Nutrition						
Year 1		Year 2	Year 3	Year 4	Year 5	Year 6
Design	**Focus: Preparing fruit and vegetables**	**Focus: Balanced Diet**	**Focus: Sensory Exploration**	**Focus: Healthy and Varied Diet**	**Focus: Celebrating Culture- breads**	**Focus: Celebrating Seasonal Food**

	Purpose: create a healthy summer snack Can say what product they are designing and making Explain who the product is for • Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings.	Purpose: an energy bar for explorer • Research and design appealing products and packaging for a particular user based on simple design criteria. • Describe what product they are designing and making • Describe what the product is for and how it will work • Explain how they can make their product suitable for their intended\ user	Purpose: create dips and dippers like to Ancient Egypt link- bread dips and dippers • Evaluate the product: design and use. • Explore what methods of construction have been used • Discuss how well the product achieve its purpose • Research famous inventors/ designers.	Purpose: produce a healthy meal based on Mediterranean ingredients (topic Italy) • Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate information and communication technology, such as web- based recipes, to develop and communicate ideas.	Purpose: compare and make breads linked to South America and Vikings • Carry out research using questionnaires to gather information Identify the needs and wants of a particular individual or group • Produce a creative mood board to present the theme of the design brief/topic using multiple resources as well as displaying facts about its intended client	Purpose: Adapt a recipe using seasonal foods • Carry out research using surveys, interviews and the web to inform design ideas. • Use the data from their research, to identify the needs, wants, preferences and values of the client Can produce an innovative 3D mood board to present the theme of the design brief/topic using multiple resources and display facts about its intended client

Making	• Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. • Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. With help and supervision, put together cold ingredients	• Understand how to prepare food safely and hygienically. Can describe the properties of food: Ingredients, taste, smell, texture and consistency. • Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely with support where appropriate o •Measure & weigh – non-statutory measures • Ingredients should be combined according to their sensory characteristics.	• Can select appropriate techniques and tools to make a product. • With support, begin to use weighing scales to measure and weigh ingredients • Understand how to assemble and arrange ingredients for simple dishes (eg apple crumble, scrambled egg on toast)	• Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients. • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.	• Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose.	• Can produce a descriptive plan of making for each stage, including a list of tools, equipment and materials needed for the product • Measure, mark, cut and shape materials with *skill, accuracy and flair.* • Join, assemble, combine materials and components with *skill, accuracy and flair.* • Demonstrate problem solving skills when encountering a mistake or problem. • Use finishing techniques, including skills learnt in art with *skill, accuracy and flair.*
Evaluating	• With support, can use a basic word bank descriptor to identify the texture and/or appearance of a product Can taste their final products	• Use a basic word bank descriptor to describe some of the texture, appearance or taste of a product	• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.	• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams.	• Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams.	• Confidently and independently select and use a range of word bank descriptors to describe the texture, appearance,

	and describe what they like and dislike	• Taste their final products and describe likes and dislikes. • Can verbally provide a suggestion of how it could be further improved	• Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	• Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.	• Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.	taste, aroma and nutrition of a product • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements.
Technical knowledge and Understanding	• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of *The Eatwell Guide*. • Know and use technical and sensory vocabulary relevant to the project.	• Know there are some super foods. • Know foods give us particular nutrients • Begin to sort foods into food groups • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from Understand that we all need a balanced diet to be healthy and active and need to eat more or less of different foods	• Can weigh and measure ingredients accurately and follow a given recipe to create a dish. • Can talk about which foods are healthy and which are not. Can discuss when food is ready for harvesting.	• Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately	• Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.	• Join & combine a range of ingredients • Measure & weigh using scales. • Know how to prepare food products taking into account the properties of the ingredients. • Know that recipes can be adapted to • Know that a recipe can be adapted by adding or substituting one or more ingredients. • Cook using a heat source

Electrical Systems		
	Year 4	Year 6
Design	**Focus: Simple circuits and switches** • Gather information about needs and wants, and 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.	**Focus: Monitoring and control** • Develop a design specification for a functional product that responds automatically to changes in the environment. • Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.
Making	• Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • 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 their electrical product to respond to changes in the environment.
Evaluation	• Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose.
Technical knowledge and Understanding	• Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project.	• Understand and use electrical systems in their products. • Understand the use of computer control systems in products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.

Mechanisms and Mechanical Systems				
	Year 1	Year 2	Year 4	Year 5
Designing	**<u>Focus: Sliders and levers</u>** Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	**<u>Focus: Wheels and axles</u>** • Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	**<u>Focus: Levers and linkages</u>** Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. •Use annotated sketches and prototypes to develop, model and communicate ideas.	**<u>Focus: Pulleys or gears</u>** Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.
Making	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card.	• Use simple finishing techniques suitable for the product they are creating. • Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating.	Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.
Evaluation	•Explore a range of existing books and everyday products that use simple sliders and levers.	• Explore and evaluate a range of products with wheels and axles.	•Investigate and analyse books and, where available, other products with lever and linkage mechanisms.	•Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the

	• Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	• Evaluate their ideas throughout and their products against original criteria.	• Evaluate their own products and ideas against criteria and user needs, as they design and make.	design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.
Technical knowledge and understanding	•Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.	•Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. •Know and use technical vocabulary relevant to the project.	• Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.

Textiles			
	Year 2	Year 3	Year 5
Design	**Focus: Templates and joining techniques** • Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	**Focus: 2-D shape to 3-D product** • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	**Focus: Combining different fabric shapes** •Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, 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 specification.
Making	• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use textiles according to their characteristics.	• Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.	• Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.
Evaluation	• Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.	• Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Take into account others' views.	• Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification.

		• Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	• Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.
Technical knowledge and understanding	• Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. • Know and use technical vocabulary relevant to the project.	• Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.	• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.

Structures			
	Year 1	Year 3	Year 5
Design	**Focus: Freestanding structures** • Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings. .	**Focus: Shell structures using computer-aided design (CAD)** • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing shell structures and use computer- aided design to model and communicate ideas.	**Focus: Frame structures** • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.
Making	• Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.	• Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating.	• 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 from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making.

Evaluating	• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria. • Know and use technical vocabulary relevant to the project	**Evaluating** • Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	• Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.
Technical knowledge and understanding	• Know how to make freestanding structures stronger, stiffer and more stable.	• Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Develop and use knowledge of how to construct strong, stiff shell structures. • Know and use technical vocabulary relevant to the project.	• Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.