Design and Technology Knowledge and Skills Progression

Intent

At Borrow Wood we believe that design and technology is essential to prepare pupils to participate in tomorrow's rapidly changing world. This aligns closely with our School Vision of promoting curiosity and ensuring that the children develop the necessary skills and knowledge to succeed in life.

Teachers ensure that children develop their investigating, designing, making and evaluating skills as they move through the school. They research, design, make and evaluate products that solve real need and relevant problems within a variety of contexts. They acquire a broad range of subject knowledge and draw on other disciplines such as mathematics, computing, science, engineering and art. By the time they leave us, we want them to be resourceful, innovative, imaginative and enterprising pupils.

We feel that it is vitally important that all of our children know about healthy eating and learn skills that enable them to feed themselves and others affordably and well, now and in later life.

Our DT curriculum is also closely aligned to our CHOICE ethos and 'Challenge'. In DT children are encouraged to 'have a go, make mistakes and try again' throughout the design and evaluation process.

Design and Technology Skills (All these skills to be incorporated into each 'Technical Knowledge' unit)

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Research	To look at existing products and discuss them – what do they look like?	To explore some existing products. Who is it for? What is the product used for?	To explore some existing products. What materials are used? How do the products	To explore some existing products. When was the product made? Where was the product designed	To explore some existing products. How well does the product achieve its purpose? How environmentally	To explore some existing products. Does the product have any other purpose? How environmentally	To research the costs involved in creating a product, sell a product and what the profit margin would be.

	What are they used for?	Where might you find the product?	work? Who made the product? To express opinions about the different products that they have researched.	and made? What methods of construction have been used? To evaluate the product on its design, material, and use. To research famous inventors and designers.	friendly is the product? How environmentally friendly are the resources? To evaluate the product on design and use and appearance To research and find out about famous inventors and designers	friendly is the product? How environmentally friendly are the resources?	To use research into famous designers and inventors and to use market research to inform the design of their product.
Design	To talk about what they are going to make and what materials they might use To draw and talk about their design drawings	To create simple design drawings on paper Talk about what they are going to make. To suggest ideas and explain what product they will be designing and making to others.	To plan specific elements of their design with sketches and notes to support their ideas To develop their design ideas through discussion, observation, drawing and modelling. To identify a clear purpose for their product	To identify a purpose and establish a design criterion for their product (i.e., what do they want the product to do or achieve). To develop ideas by producing drawings and diagrams. To develop more than one design or adaptation of the original design. To generate realistic ideas that meet the needs of the user/s.	To describe the design purpose of their product Produce detailed designs, annotated with materials, measurements, and joins.	To develop their own design criteria To create designs using simple computer programmes To identify design features that will appeal to intended users.	To generate, develop, model, and communicate their design ideas through annotated sketches, cross-sectional and exploded diagrams and computer aided design programmes.
Make	To build with blocks	To select and use simple utensils, tools, and	To choose appropriate tools, equipment,	To safely measure, mark out, cut, assemble, and join	To read and follow a recipe or set of instructions that	To apply knowledge of materials and	To produce detailed lists of

	To begin to use tools effectively and safely e.g., scissors, hole punch To be supported to select and use appropriate processes and tools e.g., cutting and chopping To know different fixing techniques e.g., masking tape, glue, sticky tape. To use a hole punch and paper fasteners such as split pins. To cut paper with scissors following curved and straight lines.	equipment to perform practical tasks e.g., cutting, shaping, joining, and finishing To use a range of tools to cut, join and combine materials safely and correctly e.g., scissors. To use techniques such as cutting, chopping, and pealing to prepare fruits and vegetables.	techniques, and materials from a wide range using the correct vocabulary to name them. To safely measure, mark out, cut, and shape materials from a wide range using a range of tools showing some accuracy. To use simple tools to prepare ingredients e.g., chopping, cutting, peeling, and grating. To measure and weigh ingredients.	with some accuracy To make sensible choices from a wider range of tools To use a range of techniques to join and combine materials or ingredients e.g., slicing and mixing. To measure and weight ingredients using scales with support. Follow procedures for safety and hygiene e.g., using an oven.	involves several processes. To select suitable tools and begin to use them accurately. To use a range of techniques to assemble, join and combine materials and/or components with some accuracy. Follow procedures for safety and hygiene.	techniques to refine and rework their product to improve its functional and aesthetic qualities. To use tools to make careful measurements so that joins, holes, and openings are accurate. To use technical knowledge and skills to problem solve during the making process. To use advanced methods for mixing ingredients. To measure and weigh ingredients using different scales. To cook using a heat source such as an oven under supervision using the basic functions independently. To use a range of cooking techniques e.g., chopping, peeling, grating, slicing, mixing, kneading.	tools, equipment, and materials. Where possible, allocate jobs within a team. To make products that are accurately assembled and well finished. To work within constraints of time and resources and adapt ideas to meet these constraints. To follow procedures for safety and hygiene.

Evaluate	To talk about their design ideas and what they have made To identify what they liked and didn't like about their product To share their creations, explaining the process they have used. (ELG)	To talk about their design ideas and what they have made. To talk about what they like about their product. To identify strengths and weaknesses, what works and what doesn't?	To discuss more closely how their product meets their design criteria. To discuss how their product could be improved.	To evaluate their product against their original design (criteria) at the end of the process. To use their design criteria to evaluate their product; identify strengths and areas for development To consider the views of the user whilst evaluating.	To evaluate their product against the original design criteria throughout the process. To use the design criteria to evaluate their product, identifying strengths and areas for development. To consider the views of the user in their evaluation.	To evaluate their work both during and at the end of the process. To discuss how appropriate tests could be carried out to test for improvements. To evaluate the product based on what does/doesn't work and seek advice from others on improvements.	To critically compare the final product to the original design. To test products with intended users (if possible) to evaluate the quality of design, manufacture, and fitness for purpose.

Technical knowledge to be learnt across the year groups.

	EYFS	Year 1/2	Year 3/4	Year 5/6
Mechanisms	**Junk Modelling** **Technical knowledge**: To be able to manipulate paper by curling, bending, and tearing. To be able to name and use basic joining methods and tools e.g.,	**Sliders and levers** **Technical knowledge**: To know what levers and sliders are and that they can move things To identify whether a mechanism is a slider or a lever	**Levers and linkages** **Technical knowledge**: To know the difference between a lever and a linkage To know the difference between a fixed and loose pivot	**Pulleys and gears** **Technical knowledge**: Know and understand what a gear and a pulley is. To know that gears and pulleys can be used to change speed and direction of movement.

	glue, tape, staples, scissors, hammer, split pin. To be able to safely use and explore a variety of materials, tools, and techniques, experimenting with design, form, and function. **Core knowledge**: Split pins, tape, staples, and glue are ways of joining materials together.	To understand that different mechanisms create different types of movement To know different fixing techniques e.g., masking tape **Core knowledge**: A lever is a rigid bar that moves around a pivot A slider is a rigid bar that moves forwards and backwards along a straight line Levers and sliders make things move **Wheels and axels** **Technical knowledge**: To know and understand what wheels, axels and axel holders are To know the difference between fixed and free moving axels To know how to fix wheels and axels to a product. To know ways of holding free moving axels in a product. **Core knowledge**: An axel holder is the part where the axle fits and rotates An axel is a rod that enables a wheel to rotate	To know and create guides to control movement To know the input and output of a mechanism To be able to identify levers and linkage mechanisms in everyday objects **Core knowledge**: A lever is a rigid bar which moves around a pivot A linkage is the card strips that joins the levers to make the movement A fixed pivot attaches a lever to a base A loose pivot attaches two levers together	To understand the ratio in a gear or pulley system (how often larger wheels turn in relation to small pulleys or the number of teeth in gears) To be able to identify gear and pulley mechanisms in everyday objects **Core knowledge**: A gear is a wheel with teeth around its circumference A pulley is a grooved wheel over which a belt can run Mechanisms need a force to make them move A force causes an object to start moving, stop moving, slow down or change directions

Structures	**Free standing structures** **Technical knowledge**: To know what a structure is. To know how they could make their structure stronger. **Core knowledge** Some materials are stronger than others Joining different materials together can make a structure stronger.	**Free standing structures** **Technical knowledge**: To know the simple order of making a structure. To know how to create and use a template. To begin to understand and know how to make a free-standing structure stronger, stiffer, and more stable To use joining, rolling, curling, sticking, or folding to make structures stronger. (Children should also be given the opportunity to use construction kits during continuous provision) **Core knowledge**: A structure is something of many parts that is put together A triangle is the strongest shape for a structure A free-standing structure is not attached to another structure Making a base wider can make structures stiffer, stronger, and more stable	**Shell structures** **Technical knowledge**: Understand what a shell structure is and identify real life examples. Use pre-drawn nets to make 3D card structures. Cut, score and fold card accurately. Use a glue gun (where appropriate) with supervision (one- to -one). Join nets using glue and gluing tabs. Join 2D frames/shapes to create 3D structures. Use laminating, corrugating and ribbing techniques to stiffen and strengthen products. To know how to test a materials strength To know how to use CAD to develop a product To understand the environmental issues relating to the wastage of materials **Core knowledge**: Laminating, corrugating, and ribbing are all ways of stiffening and strengthening structures The flat or opened out shape of an object, such as a box, is called a net Reducing, recycling, and re-using are three ways to save the environment when using materials	**Frame structures** **Technical knowledge**: To know how to stiffen, strengthen and re-inforce 3D frameworks To know which materials are best suited to stiffen and re-inforce by selecting them due to their properties To know which shapes are the strongest and will support the most weight in a structure To understand the term triangulation To know to perform simple tests to test the functionality and strength of products **Core knowledge**: Triangulation is triangular shapes that make a structure stronger Frame structures are created by joining straws or thin pieces of wood Timing, resources, and costs can become constraints when building a structure.

Cooking and Nutrition	**Technical knowledge**: To be able to name and sort healthy and unhealthy foods To develop a food vocabulary e.g., soft, hard To understand the importance of handwashing and wearing an apron whilst cooking To handle cooking equipment safely and effectively **Core knowledge**: Healthy foods are good for your health Too many unhealthy foods are bad for your health It is important to always wash your hands and wear an apron when cooking.	**Technical knowledge**: To understand where food comes from (KS1) To understand that food comes from plants and animals, and some must be farmed, caught, or reared (KS2) To name familiar foods. To know some safety and hygiene procedures e.g., to know it is important to wash hands before preparing food and to wash fruit before we eat it. To use simple utensils to process food and make it easier to eat To peel and chop food when supervised To mix ingredients with hands or with a spoon. To understand the need for a variety of foods in the diet To understand the importance of a healthy, balanced diet and create a product that shows this. To understand that fruit is an essential part of a balanced diet, and 5 portions of fruit and vegetables are recommended per day. **Core knowledge** Eating a variety of different foods keeps us healthy Food comes from plants or animals	**Technical knowledge**: To understand what nutritional benefits different food types give us To understand that all foods must be farmed, grown, or caught and that food comes from the UK and from across the world To know where to find the nutritional information on packaging To know safety and food hygiene measures and to follow them. To know and understand the components of a balanced diet To make healthy choices for a snack design To follow a simple recipe To understand how to combine ingredients to make a tasty snack, considering flavour and texture. To know how to cut, chop, peel, grate, and slice food safely. To know how to mix ingredients using a spoon or whisk. To use an oven (where appropriate, under supervision) **Core knowledge**: The main food group are carbohydrates, proteins, fruit and vegetables, dairy, oils, and spreads. Farmed foods are grown on farms, allotments, gardens, or windowsills	**Technical knowledge**: To understand where food comes from e.g., learning that beef is from cattle and how beef is reared and processed To understand where food comes from describing the process of 'farm to fork' for a given ingredient To understand the environmental impact of products and cost of production To know that a recipe can be adapted by adding or substituting one or more ingredients To taste a range of foods to develop vocabulary. To be able to choose foods for a purpose, showing an awareness of the need for a balanced diet. To be able to choose foods which are in season and know where the food is from/how it has been grown. To know how to combine ingredients by kneading, beating, and whisking. To know how to cook foods on a stove or in an oven (as appropriate). **Core knowledge**: Farm to fork is the process of production, processing, distribution, and consumption of food

		Safety and hygiene procedures are important when handling, preparing, and cooking food.	Some animals, such as chickens, are reared for food. Some animals, such as fish, are caught for food.	Overfishing and non-sustainable farming has an impact on future food supplies Sterilisation and cooking temperatures keep our food safe to eat.
Textiles	**Technical knowledge**: To know which materials would be best suited for products e.g., soft material for teddy's new socks. To know how to colour fabrics using paint and fabric paints. To be able to decorate fabrics e.g., beads and buttons. **Core knowledge** Fabrics can be joined by glue, tape, staples, or thread. A fabric is a material or cloth for making items. Fabrics can be coloured using paint or pens.	**Technical knowledge**: To know what a template is and use one to cut out shapes To learn how to join items using a simple stitch such as a running stitch To know a range of finishing techniques e.g., decoration by gluing or stitching To know the names of different types of fabrics and understand how they are constructed To understand how to add fastening such as buttons and Velcro to a product **Core knowledge** A template is a mould used as a guide to make something Fabrics can be combined through stitching (e.g., running stitch) Paints, shiny sequins, or fabric crayons are all ways of finishing a product	**Technical knowledge** To know how to securely join fabrics using sewing using cross stitching or over sewing To know how to use simple and appropriate fastenings for a product e.g., zips, buttons, Velcro. To sew using back stiches or over-sewing. To understand what a seam is and its purpose Give reasons for selecting fabrics based on their characteristics. To investigate materials other than fabrics e.g., plastic bags **Core knowledge** Cross stitch and over sewing are stitches used to join products A seam allowance is the area that stops the stitches from pulling apart Products can be decorated using stem, satin, chain, or lazy daisy stitches	**Technical knowledge** Name and know the properties of some common fabrics (cotton, linen, wool & silk) Understand how different fabrics can affect the structure/feel/appearance of a product. Pin and tack pieces before sewing. Join fabrics using the variety of stitches taught (KS1-KS2). Assemble 3D products from patterns or templates. **Core knowledge** A pattern is the template from which the parts of a garment are traced onto fabric before being cut out and assembled

Electrical systems *NB. very similar to science objectives. Complete unit alongside/after science unit appears in LTP.*	**Technical knowledge** N/A	**Technical knowledge** N/A (See other documents for ideas/concepts to discuss with children to prepare them for KS2 topics)	**Technical knowledge** To know what an electrical circuit is To know what a bulb, buzzer and switch are and their functions To construct a simple series circuit to generate static electricity To know how to make simple secure connections To know different switch types e.g., push to break, push to make, reed and toggle switch **Core knowledge** An electrical circuit is a path through which electricity passes A complete circuit is needed for electricity to flow and devices to work A bulb is a component that lights up when electricity passes through it A switch is a device that opens and closes an electrical circuit	**Technical knowledge** To know how to construct a simple series circuit confidently To incorporate simple self-made switches into a circuit To know how to test components and assess faults in a series circuit To know that mechanical and electrical systems have an input, process, and output To understand the safety risks when using electricity To know how to use bulbs, buzzers, motors, and switches. To understand how to draw a circuit diagram. To understand how to build a circuit for a particular purpose. **Core knowledge** Lights and buzzers are output devices Batteries and switches are input devices Current is how much electricity is flowing around a circuit Safety with electronics is very important as electricity can kill.		

Key vocabulary

Key vocabulary: skills specific ***N.B** vocabulary should progress*	**Research**: Look, observe, listen, touch, feel, smell	**Research**: Explore, products, user	**Research** Existing products, materials, opinion,	**Research** Existing products, materials, opinion, purpose, design	**Research** Existing products, design, made, evaluate, material	**Research** Purpose, product, environmentally friendly, consumer,	**Research**: Costing, sell environmentally friendly, appearance.

in the same way that D.T skills do. Children are expected to use and build on their vocabulary from the year(s) before.	**Design** Think about, ideas, draw, try, talk, listen, share **Make**: Join, stick, fix, cut, hold, chop, cut, peel, skin, **Evaluate**: Design, like, dislike, product	**Design** Ideas, design, target group, intent, product, paper, card, model **Make** Utensils, tools, equipment, perform, cut, shape, join, finish, materials, tools, safely, chop, cut, peel **Evaluate** Design idea, talk, strengths, weaknesses, intended purpose	**Design** Discussion, observation, drawing, modelling, design criteria, purpose, intent, sketches, notes, record, explanations **Make** Appropriate, tools, equipment, techniques, equipment, vocabulary, measure, mark out, cut, shape, materials, components, accuracy, chopping, cutting, peeling, grating, measure, weight, scales **Evaluate** Design criteria, discussion, product, improve	**Design** Discussion, observation, drawing, modelling, design criteria, purpose, intent, sketches, annotations **Make** Appropriate, tools, equipment, techniques, equipment, vocabulary, measure, mark out, cut, shape, materials, components, accuracy, chopping, cutting, peeling, grating, measure, weight, scales **Evaluate** Design criteria, discussion, product, improve, compare, fit for purpose	**Design** Design criteria, product, cross-sectional drawings, diagrams, initial, adaption, generate, ideas Make Safety, measure, mark, cut, assemble, join, accuracy, tools, junior hacksaw, techniques, ingredients, slicing, mixing, heat source, oven **Evaluate** Evaluation, design criteria, strengths, areas of development, fit for purpose, user needs.	Market **Design** Develop, features, users, consumers **Make** Techniques, function, aesthetic, apply, **Evaluate** Design decisions, functionality, authentic, user, purpose, design specification, design brief, innovative, research, evaluate, design criteria, annotate,	**Design**: Inventors, develop, communicate, prototypes, computer aided design. **Make** Refine, aesthetic, functions, measure, mass, weight. **Evaluate**: Design decisions, functionality, authentic, user, purpose, design specification, design brief, innovative, research, evaluate, design criteria, annotate,

						evaluate, mock-up, prototype	evaluate, mock-up, prototype
Key vocabulary (topic specific) ***N.B*** *vocabulary should progress in the same way that D.T skills do. Children are expected to use and build on their vocabulary from the year(s) before.*	**Structures** Sellotape, glue, stick, masking tape, structure, stronger, fold, parts, triangle	**Structure**: Free-standing, cut, fold, join, fix, weak, strong, glue gun, glue, tape, stronger, stiffer, stable, template		**Structures** Shell, structure, net, stiffening, strengthening, strength, computer aided design, environmental issues, wastage	**Structures** Shell, structure, net, stiffening, strengthening, computer aided design, environmental issues, wastage		***Structures*** Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent
	Mechanisms Tear, bend, fold, join, curl, roll, glue, tape, staples, hammer, scissors, move, mechanism	**Mechanisms** Mechanism, lever, slider, slot, pivot, guide/bridge, masking tape, fastener, movement, fixing technique	**Mechanisms** Wheel, axel, fixed, free, design, make, cutting, joining, product, axel holder, rode, rotate		**Mechanisms** Levers, linkage, fixed, loose, guide, movement, mechanism, input, output		**Mechanisms** pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor, circuit, switch, circuit diagram, annotated drawings, exploded diagrams, mechanical system, electrical system, input, process, output

	Textiles Join, fasten, bead, button, material, fabric, felt, colour, decorate **Cooking and Nutrition** Fruit, vegetables, healthy, unhealthy, taste, smell, texture, appearance, safety, hygiene, hand washing, apron,	**Cooking and Nutrition**: Fruit, vegetables, healthy diet, plants, animals, safety, food hygiene, procedures, balanced diet, preparing, handling, cooking	**Textiles** Template, mould, joining, running stitch, finishing technique, decoration, fabrics, constructed, fastenings	**Textiles** Template, mould, joining, running stitch, finishing technique, decoration, fabrics, constructed, fastenings, 2 dimensional, 3 dimensional **Cooking and Nutrition**: Nutrition, food types, farmed, grown, caught, UK, world, nutritional information, packaging, safety, food hygiene, carbohydrates, proteins, fruits and vegetables dairy, oils, and spreads.		**Textiles** 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, **Cooking and Nutrition** ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, 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	**Cooking and Nutrition** ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, 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	in, whisk, beat, roll out, shape, sprinkle, crumble
					Electrical systems 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		**Electrical systems** 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