

Hardwick Green Primary Academy

Design & Technology Subject Overview & Progression

	Cooking & nutrition	Mechanical systems	Structures	Textiles	Electrical systems
KS1 Cycle A	Food: A balanced diet Kapow - Year 2	Wheels & Axels Kapow – Year 1	Structures: Baby Bear's Chair Kapow - Year 2		
KS1 Cycle B	Food: Fruit and vegetables Kapow - Year 1	Mechanisms: Making a moving monster Kapow - Year 2		Textiles: Puppets Kapow - Year 1	
Year 3		Mechanical systems: Pneumatic toys Kapow – Year 4	Structures: Constructing a castle Kapow – Year 3		
Year 4	Food: Eating seasonally Kapow - Year 3			Textiles: Cushions Kapow – Year 3 Textiles: Fastenings Kapow – Year 4	Electrical systems: Torches Kapow – Year 4
Year 5	Food: Adapting a recipe Kapow – Year 4 Food: What could be healthier? Kapow – Year 5	Mechanical systems: Pop-up book Kapow - Year 5	Structure: Bridges Kapow – Year 5		
Year 6					Electrical systems: Steady hand game Kapow – Year 6



Design & Technology - Progression in knowledge:

	EYFS	KS1	LKS2	UKS2
Ch •	ildren can: Select appropriate resources Use gestures, talking and arrangements of materials and components to show design	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.	pupils should be taught the knowledge, understanding and skills needed to engage in an	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.
•	Use contexts set by the teacher and themselves Use language of designing and making (join, build, shape, longer, shorter, heavier etc.)	example, the home and school, gardens and	example, the home, school, leisure, culture, enterprise, industry and the wider environment].	They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. Children use research and develop design criteria to inform the design of innovative, functional, appealing
		products for themselves and other users based on design criteria.	products that are fit for purpose, aimed at particular individuals or groups.	products that are fit for purpose, aimed at particular individuals or groups.
			their ideas through discussion, annotated sketches,	their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer- aided design.
Design - General		 Children can: use their knowledge of existing products and their own experience to help generate their ideas; design products that have a purpose and are aimed at an intended user; explain how their products will look and work through talking and simple annotated drawings; design models using simple computing software; plan and test ideas using templates and mock-ups; understand and follow simple design criteria; work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment. 	 identify the design features of their products that will appeal to intended customers; use their knowledge of a broad range of existing products to help generate their ideas; design innovative and appealing products that have a clear purpose and are aimed at a specific user; explain how particular parts of their products work; use annotated sketches and cross-sectional drawings to develop and communicate their ideas; 	 design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market; use their knowledge of a broad range of existing products to help generate their ideas; design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user; explain how particular parts of their products work; use annotated sketches, cross-sectional drawings and exploded diagrams (possibly including computer-aided design) to develop and communicate their ideas; generate a range of design ideas and clearly communicate final designs; consider the availability and costings of resources when planning out designs; work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment.

	EYFS	KS1	LKS2	UKS2
(Children can: Construct with a purpose, using a variety of resources Use simple tools and techniques 	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 making.	pupils should be taught the knowledge, understanding and skills needed to engage in an	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 making.
	 Use simple tools and techniques Build / construct with a wide range of objects Select tools & techniques to shape, assemble and join Replicate structures with materials / components 	Children select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. sThey select from and use a wide range of materials	and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]	Children select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.
	 Discuss how to make an activity safe and hygienic Record experiences by drawing, writing, voice recording 	and components, including construction materials, textiles and ingredients, according to their characteristics.	and components, including construction materials,	They select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.
•	 Understand different media can be combined fo a purpose 	r Planning	Children can:	Children can:
		 with support, follow a simple plan or recipe; 	<u>Planning</u>	Planning
		 begin to select from a range of hand tools and equipment, such as scissors, graters, zesters, 	 with growing confidence, carefully select from a range of tools and equipment, explaining their choices; 	next;
General		 safe knives, juicer; select from a range of materials, textiles and components according to their characteristics; 	 select from a range of materials and components according to their functional properties and aesthetic qualities; 	 with growing confidence, select from a wide range of tools and equipment, explaining their choices;
Make - (Practical skills and techniques learn to use hand tools and kitchen equipment	 place the main stages of making in a systematic order; 	 select from a range of materials and components according to their functional properties and aesthetic qualities;
		 learn to use nand tools and kichen equipment safely and appropriately and learn to follow hygiene procedures; 	Practical skills and techniques	create step-by-step plans as a guide to making;
		 use a range of materials and components, including textiles and food ingredients; 	 learn to use a range of tools and equipment safely, appropriately and accurately and learn to follow hygiene procedures; 	Practical skills and techniques learn to use a range of tools and equipment safely and appropriately and learn to follow
		• with help, measure and mark out;	 use a wider range of materials and components, including construction materials 	hygiene procedures;
		• cut, shape and score materials with some accuracy;	and kits, textiles and mechanical and electrical components;	 independently take exact measurements and mark out, to within 1 millimetre;
		 assemble, join and combine materials, components or ingredients; 	• with growing independence, measure and mark out to the nearest cm and millimetre;	 use a full range of materials and components, including construction materials and kits, textiles, and mechanical components;
		• demonstrate how to cut, shape and join fabric to make a simple product;	 cut, shape and score materials with some degree of accuracy; 	 cut a range of materials with precision and accuracy;
		 manipulate fabrics in simple ways to create the desired effect; 	assemble, join and combine material and components with some degree of accuracy;	 shape and score materials with precision and accuracy;
		• use a basic running stich;		

•	cut, peel and grate ingredients, including measuring and weighing ingredients using measuring cups;	•	demonstrate how to measure, cut, shape and join fabric with some accuracy to make a simple product;	•	assemble, join and combine materials and components with accuracy;
•	begin to use simple finishing techniques to improve the appearance of their product, such as adding simple decorations.		join textiles with an appropriate sewing technique; begin to select and use different and appropriate finishing techniques to improve the appearance	•	demonstrate how to measure, make a seam allowance, tape, pin, cut, shape and join fabric with precision to make a more complex product; join textiles using a greater variety of stitches,
•	simple decorations.		of a product such as hemming, tie-dye, fabric paints and digital graphics.	•	such as backstitch, whip stitch, blanket stitch;
					refine the finish using techniques to improve the appearance of their product, such as sanding or a more precise scissor cut after roughly cutting out a shape.

EYFS	KS1	LKS2	UKS2
Children can: Adapt work if necessary Dismantle, examine, talk about existing objects/structures Consider and manage some risks Practise some appropriate safety measures independently Talk about how things work Look at similarities and differences between existing objects / materials / tools Show an interest in technological toys Describtextures 	 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. Children explore and evaluate a range of existing products. They evaluate their ideas and products against design criteria. Children can: explore and evaluate existing products mainly through discussions, comparisons and simple written evaluations; explain positives and things to improve for existing products; explore what materials products are made from; talk about their design ideas and what they are making; as they work, start to identify strengths and possible changes they might make to refine their existing design; evaluate their products and ideas against their simple design criteria; 	 products. They evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. They understand how key events and individuals in design and technology have helped shape the world. Children can: explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose; explore what materials/ingredients products are made from and suggest reasons for this; consider their design criteria as they make progress and are willing to alter their plans, sometimes considering the views of others, if this 	 manufacture and fitness for purpose of products as they design and make; evaluate their ideas and products against the original design criteria, making changes as needed.

		EYFS	KS1	Year 3 / Year 4 Year 5 / Year 6
Structures	Design	 Making verbal plans and material choices. Developing a junk model. 	 Generating and communicating ideas using sketching and modelling. Learning about different types of structures, found in the natural world and in everyday objects. 	 Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. Designing and/or decorating a castle tower on CAD software. Designing a stable structure that is able to support weight. Creating a frame structure with a focus or triangulation.
	Make	 Improving fine motor/scissor skills with a variety of materials. Joining materials in a variety of ways (temporary and permanent). Joining different materials together. Describing their junk model, and how they intend to put it together 	 Making a structure according to design criteria. Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper. 	 Constructing a range of 3D geometric shapes using nets. Creating special features for individual designs. Making facades from a range of recycled materials. Using triangles to create truss bridges that span a given distance and support a load Building a wooden bridge structure. Independently measuring and marking we accurately. Selecting appropriate tools and equipmer particular tasks. Using the correct techniques to saws safe Identifying where a structure needs reinforcement and using card corners for support. Explaining why selecting appropriates is an important pathe design process. Understanding basic wood functional properties.
Struc	Evaluate	 Giving a verbal evaluation of their own and others' junk models with adult support. Considering what they would do differently if they were to do it again. Describing their favourite and least favourite part of their model. 	 Exploring the features of structures. Comparing the stability of different shapes. Testing the strength of own structures. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of own structure. 	 Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs Adapting and improving own bridge struct by identifying points of weakness and reinforcing them as necessary. Suggestin points for improvements for own bridges a those designed by others.
	Technical Knowledge	 Children can: use a range of tools, e.g. scissors, hole punch stapler, woodworking tools, rolling pins, pastry cutters. Discover how everyday objects work by dismantling things. 	Baby Bear's Chair – Cycle A (Egg Box Dragon):	 objects are more stable. To understand the importance of strength and stiffness in structures. To know that properties are words that

		EYFS	KS1		Year 3 / Year 4		Year 5 / Year 6
	Design		 Explaining how to adapt mechanisms, using bridges or guides to control the movement. Designing a moving story book for a given audience. Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. Creating clearly labelled drawings that illustrate movement. 	•	Designing a toy which uses a pneumatic system. Developing design criteria from a design brief. Generating ideas using thumbnail sketches and exploded diagrams. Learning that different types of drawings are used in design to explain ideas clearly.	•	Designing a pop-up book which uses a mixture of structures and mechanisms. Naming each mechanism, input and output accurately. Storyboarding ideas for a book.
	Make		 Following a design to create moving models that use levers and sliders. Adapting mechanisms, when: they do not work as they should. to fit their vehicle design. to improve how they work after testing their vehicle. 	•	Creating a pneumatic system to create a desired motion. Building secure housing for a pneumatic system. Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. Selecting materials due to their functional and aesthetic characteristics. Manipulating materials to create different effects by cutting, creasing, folding and weaving.		Following a design brief to make a pop up book, neatly and with focus on accuracy. Making mechanisms and/or structures using sliders, pivots and folds to produce movement. Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
Mechanisms	Evaluate		 Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. Reviewing the success of a product by testing it with its intended audience. Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move. 	•	Using the views of others to improve designs. Testing and modifying the outcome, suggesting improvements. Understanding the purpose of exploded- diagrams through the eyes of a designer and their client.	•	Evaluating the work of others and receiving feedback on own work. Suggesting points for improvement.
	Technical knowledge	 use a range of tools, e.g. scissors, hole punch, stapler, woodworking tools, rolling pins, pastry cutters. Discover how everyday objects work by dismantling things. 	Wheels & Axels – Cycle A (Amelia Earhart):	•	neumatic toys: To understand how pneumatic systems work. To understand that pneumatic systems can be used as part of a mechanism. To know that pneumatic systems operate by drawing in, releasing and compressing air.	•	p-up book: To know that mechanisms control movement. To understand that mechanisms can be used to change one kind of motion into another. To understand how to use sliders, pivots and folds to create paper-based mechanisms. To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.

		EYFS	KS1	Year 3 / Year 4	Year 5 / Year 6
	Design	•	 Using a template to create a design for a puppet. 	 Designing and making a template from an existing cushion and applying individual design criteria. Writing design criteria for a product, articulating decisions made. Designing a personalised book sleeve. 	
	Make	 Developing fine motor/cutting skills with scissors. Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. Using a prepared needle and wool to practise threading. 	 Cutting fabric neatly with scissors. Using joining methods to decorate a puppet. Sequencing steps for construction. 	 Following design criteria to create a cushion or Egyptian collar. Selecting and cutting fabrics with ease using fabric scissors. Threading needles with greater independence. Tying knots with greater independence. Sewing cross stitch to join fabric. Decorating fabric using appliqué. Completing design ideas with stuffing and sewing the edges (Cushions). Making and testing a paper template with accuracy and in keeping with the design criteria. Measuring, marking and cutting fabric using a paper template. Selecting a stitch style to join fabric. Working neatly by sewing small, straight stitches. Incorporating a fastening to a design. 	
Textiles	Evaluate		 Reflecting on a finished product, explaining likes and dislikes. 		
	Technical Knowledge	 Children can: use a range of tools, e.g. scissors, hole punch, stapler, woodworking tools, rolling pins, pastry cutters. Discover how everyday objects work by dismantling things. 	 Puppets - Cycle B (Traction Man) To know that 'joining technique' means connecting two pieces of material together. To know that there are various temporary methods of joining fabric by using staples. glue or pins. To understand that different techniques for joining materials can be used for different purposes. To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. To know that drawing a design idea is useful to see how an idea will look. 	 Cushions To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. To know that when two edges of fabric have been joined together it is called a seam. To know that it is important to leave space on the fabric for the seam. 	

		EYFS	KS1	LKS2 UKS2
	Design	KS2 only	KS2 only	 Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. Designing a steady hand game - identify and naming the components required. Drawing a design from three different perspectives. Generating ideas through sketching and discussion. Modelling ideas through prototypes. Understanding the purpose of products including what is meant by 'fit for purpose 'form over function'.
	KS2 only KS2 only KS2 only KS2 only KS2 only KS2 only KS2 only	 Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria. Constructing a stable base for a game. Accurately cutting, folding and assemblin net. Decorating the base of the game to a his quality finish. Making and testing a circuit. Incorporating a circuit into a base. 		
Electrical Systems	Evaluate	KS2 only	KS2 only	 Evaluating electrical products. Testing and evaluating the success of a final product Testing own and others finished games, identifying what went well and making suggestions for improvement. Gathering images and information abou existing children's toys. Analysing a selection of existing children toys.
Elec	Technical Knowledge	KS2 only	KS2 only	 Torches To understand that electrical conductors are materials which electricity can pass through To understand that electrical insulators are materials which electricity cannot pass through To know that a battery contains stored electricity that can be used to power products To know that an electrical circuit must be complete for electricity to flow To know that a switch can be used to complete and break an electrical circuit To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison To understand the diagram perspectives

		EYFS	KS1	LKS2	UKS2
	Design		 Designing smoothie carton packaging byhand or on ICT software Designing a healthy wrap based on a food combination which work well together. 	ating a healthy and nutritious oury tart using seasonal ingre sidering the taste, texture, sm earance of the dish.	dients, drawing upon previous taste testing
Cooking & Nutrition	Make	 Chopping plasticine safely. Chopping vegetables with support. 	 Chopping fruit and vegetables safely to make a smoothie. Slicing food safely using the bridge or claw grip. Constructing a wrap that meets a design brief. 	wing how to prepare themsel k space to cook safely in, lear ic rules to avoid food contami owing the instructions within a	nation. including the preparation of ingredients. • Cooking safely, following basic hygiene rules.
	Evaluate	 Tasting food and giving opinions. Describing some of the following when tasting food: look feel, smell and taste. Choosing their favourite packaging design and explaining why. 	 Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggesting information to be included on packaging Describing the taste, texture and smell of fruit and vegetables. Taste testing food combinations and final products. Describing the information that should be included on a label. Evaluating which grip was most effective. 	ablishing and using design cri and review dishes. scribing the benefits of seasor etables and the impact on the ironment. gesting points for improveme king a seasonal tart.	 teria to help Evaluating a recipe, considering: taste, smell, texture and appearance. Describing the impact of the budget on the selection of ingredients. Evaluating and comparing a range of food

	Children can:	Fruit and vegetables:	Eating seasonally	Adapting a recipe
Technical Knowledge	 Begin to understand some food preparation tools, techniques and processes Practise stirring, mixing, pouring, blending Discuss how to make an activity safe and hygienic Discuss use of senses Understand need for variety in food Begin to understand that eating well contributes to good health 	 Understanding the difference between fruits and vegetables. To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). To know that a blender is a machine which mixes ingredients together into a smooth liquid. To know that a fruit has seeds and a vegetable does not. To know that fruits grow on trees or vines. To know that vegetables can grow either above or below ground. To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber) A balanced diet To know that 'diet' means the food and drink that a person or animal usually eats. To understand what makes a balanced diet. To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein dairy and foods high in fat and sugar. To understand that I should eat a range of different foods from each food group. To know that nutrients are substances in food that all living things need to make energy, grow and develop. To know that 'ligredients' means the items in a mixture or recipe. To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy. To know that many food and drinks we do no expect to contain sugar do; we call these 'hidden sugars'. 	 To know safety rules for using, storing and cleaning a knife safely. To know that similar coloured fruits and vegetables often have similar nutritional benefits. 	 recipe is known as the 'quantity.' To know that it is important to use oven gloves when removing hot food from an oven. To know the following cooking techniques: sieving, creaming, rubbing method, cooling. To understand the importance of budgeting while planning ingredients for biscuits.