SKILLS DEVELOPMENT IN DESIGN AND TECHNOLOGY

LO: TO MASTER PRACTICAL SKILLS, TO DESIGN, MAKE, EVALUATE AND IMPROVE, TO TAKE INSPIRATION FROM DESIGN THROUGHOUT HISTORY

Key stage 1

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].

When designing and making, pupils should be taught to:

Design

♣ design purposeful, functional, appealing products for themselves and other users based on design criteria

♣ generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

♣ select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]

♣ select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

♣ explore and evaluate a range of existing products

♣ evaluate their ideas and products against design criteria

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

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].

When designing and making, pupils should be taught to:

Design

♣ use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups

♣ generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

♣ select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately

♣ 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

Evaluate

♣ investigate and analyse a range of existing products

♣ evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

♣ understand how key events and individuals in design and technology have helped shape the world

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.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key stage 1

♣ use the basic principles of a healthy and varied diet to prepare dishes

♣ understand where food comes from.

Key stage 2

♣ 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.

	1	2	3	4	5	6
Food	Assemble or cook ingredients.	Cut, peel or grate ingredients safely and hygienically. Use the basic principles of a healthy and varied diet to prepare dishes.	Prepare ingredients hygienically using appropriate utensils.	Follow a recipe. Understand and apply the principles of a healthy and varied diet.	Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.	Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.
	Understand where food comes from.	Measure or weigh using measuring cups or electronic scales.	Measure ingredients to the nearest gram accurately.	Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).		Create and refine recipes, including ingredients, methods, cooking times and temperatures.
Materials	Measure and mark out to the nearest centimetre	Cut materials safely using tools provided.	Cut materials accurately and safely by selecting appropriate tools.	Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).	Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).	Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).
	Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).	Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).	Measure and mark out to the nearest millimetre.	Select appropriate joining techniques.		
Textiles	Shape textiles using templates.	Join textiles using running stitch.	Join textiles with appropriate stitching.	Understand the need for a seam allowance.	Create objects (such as a cushion) that employ a seam allowance.	Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).
	Colour and decorate textiles using a number of techniques (such as dyeing,		Select the most appropriate techniques to decorate textiles.		Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles	

	adding sequins or printing).				(such as a soft decoration for comfort on a cushion).	
Construction	Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.		Choose suitable techniques to construct products or to repair items.	Strengthen materials using suitable techniques.	Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).	
Mechanics		Create products using levers, wheels and winding mechanisms.	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	Apply their understanding of computing to program, monitor and control their products.	Convert rotary motion to linear using cams.
Design, Make, Evaluate and Improve	Design products that have a clear purpose and an intended user. Explore objects and designs to identify likes and dislikes of the designs.	Make products, refining the design as work progresses. Use software to design.	Design with purpose by identifying opportunities to design.	Refine work and techniques as work progresses, continually evaluating the product design.	Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).	Make products through stages of prototypes, making continual refinements.
	Explore how products have been created.	Suggest improvements to existing designs.		Use software to design and represent product designs.	Ensure products have a high quality finish, using art skills where appropriate.	Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.
Take inspiration from design throughout history	Explore objects and designs to identify likes and dislikes of the designs.	Suggest improvements to existing designs.	Disassemble products to understand how they work.	Improve upon existing designs, giving reasons for choices.	Create innovative designs that improve upon existing products.	Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.