HCAT

Design & Technology Curriculum

Year 1 Year 2 Year3 Year 4 Year 5 Year 6

Design and Technology

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.

Aims

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.

Subject content

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.

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Make

- Select from and use a range of tools and equipment to perform practical tasks
- 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 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 [. 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 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

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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
- 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.

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HCAT Key concepts		
Product Design and Evaluation		
Food Technology	Textiles	Resistant Materials

	Transition	LKS1	UKS1	LKS2	UKS2
Design and Evaluation					
Children talk about their own and other's work and describe how a product works. **INCERTS C & D**	I can talk about mine and others work I can describe how a product works	I can comment on strengths and next steps to improve my own and others work. I recognise what I have done well in my work. I suggest things I could do in the future.	I can comment on specific methods which have been used within my own and others work. I can discuss the impact the methods have on the piece of work linked to the context of the lesson.	I make comments on the ideas, methods and approaches used in my own and others' work, relating these to the context in which the work was made I adapt and refine my work to reflect the purpose and meaning of the work. I identify what is working well and what can be improved My product is well finished in a way that would appeal to users.	I analyse and comment on ideas, methods and approaches used in my own and others' work, relating these to its context I reflect on my designs and develop them bearing in mind the way they will be used I test and evaluate my products, showing that I understand the situations my product will have to work I am aware that resources may be limited (budget, time, availability)
Children communicate their ideas through pictures and words to communicate their own ideas. ***Labelled sketches, words and models*** ***INCERTS D***	I can use pictures and words to describe what I want to do.	I can select the appropriate tools, techniques and materials, explaining my choice.	I can clarify my ideas using labelled sketches and models to communicate the details of my designs.	I can communicate alternative ideas using words, labelled sketches and models showing that I am aware of the constraints of my design.	I can use my understanding of familiar products to help develop my own ideas I can ensure and select materials with cost and workability in mind.
Children reflect on their design and modify their approach, they then evaluate the process and			I identify where my evaluations have led to improvements in my products	I reflect on my designs and develop them bearing in mind the way that they will be used	I check my work as it develops and modify it as I need to

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think about how modifying has led to improvements. **INCERTS E**			I come up with solutions to problems as they happen My designs improve as I go along.	My product is well finished in a way that would appeal to users My product is fit for purpose, and I improve it in response to a users' point of view My work incorporates the views of intended users and for the purpose.	I evaluate my products and how I used information sources to inform my design
Children can generate ideas and plan what to do next, based on experience of working with materials and components. **Children generate ideas and draw upon various sources of information.** **INCERTS C & D**	I know the features of familiar products I think of ideas and with help, can put them into practice	I think of ideas and plan what to do next, choosing appropriate tools I learn how to best store my product for long-life and hygiene	I generate ideas and recognise that my designs have to meet a range of differing needs I think ahead about the order of my work, choosing appropriate tools, equipment, materials, components and techniques	I can generate ideas by collecting and using information	I draw on and use various sources of information

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	Transition	LKS1	UKS1	LKS2	UKS2
Food					
Children select and work with a range of tools and materials with some accuracy, modifying where appropriate. **Children pay attention to quality finish and to functions.** **INCERTS - A & B & F & G**	I can use a mixing bowl to prepare a mixture. I understand that I have to wash my hands and keep work surfaces clean when preparing food. I can use knives safely to cut food (with help).	I can prepare food safely and hygienically and can describe what this means. I can describe the properties of food ingredients, taste, smell, texture and consistency. I can accurately weigh and measure my ingredients. I can describe my food product using its properties: taste, smell, texture and consistency.	I can select ingredients for my food product. I can work in a safe and hygienic way. I can measure my ingredients by weight or quantity, using scales where appropriate. I can present my food product to impress the intended user. I can describe my food product in terms of taste, flavour, texture and relate this to the intended purpose of the food. I can create a product that has been cooked or chilled to change the nature of the raw ingredients.	I can produce a food product which uses a selection of ingredients to meet an identified need (e.g. lunchtime healthy snack healthy sandwich, low gluten). I can ensure my product is well presented and packaged using other DT skills I understand that some foods may not be eaten raw, as it is unsafe. I understand that cooking alters the flavour and the texture of foods and use this knowledge in my designs.	I can use my science knowledge of irreversible changes to create food products that combine to make a new material, that I can then describe using its sensory qualities. I can use proportions and ratio to produce recipes of my food product, scaling up and down for different quantities. I can work from my own detailed plans, modifying them where appropriate.

	Transition	LKS1	UKS1	LKS2	UKS2
Textiles					
Children select and work with a range of tools and materials with some accuracy, modifying where appropriate. **Children pay attention to quality finish and to functions.** **INCERTS H & F & G**	I can measure, mark out and cut fabric. I can join fabric using glue. I can describe textiles by the way they feel. I have altered a textile to make it stronger.	I use accurate measurements in cm. I use scissors precisely when cutting out. I join textiles using glue, staples, tying or a simple stitch. I have made a textile product that has a good finish and can do the job it was made for. I understand that textiles have different properties such as; touch, insulation, texture and waterproof.	I can select the appropriate textile(s) for my product. I can use sharp scissors accurately to cut textiles. I know that the texture and other properties of materials affect my choice. I can combine materials to add strength or visual appeal. I can use accurate measurements and cutting, thinking about what impact this will have on my outcome.	I can use textiles skills such as stitching to help create a product that is sturdy and fit for purpose. I can ensure my textile products include structural changes such as plaiting or weaving to create new products such as rope, belts, bracelets etc. I confidently select appropriate textiles thinking about my final outcome. I begin to combine art skills I have looked at previously to add texture and colour to my work. I explore marking out my own patterns and templates thinking about my final outcome.	I can work from my own detailed plans, modifying them where appropriate My products have an awareness of commercial appeal. I can experiment with a range of materials until I find the right mix of affordability, appeal and appropriateness for the job I can combine art skills to add colour and texture to my work. I can mark out using my own patterns and templates.

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					I can join textiles using art skills of stitching, embroidering and plaiting to make a durable and desirable product.

	Transition	LKS1	UKS1	LKS2	UKS2
Resistant Materials					
Children select and work with a range of tools and materials with some accuracy, modifying where appropriate. **Children pay attention to quality finish and to functions.** **INCERTS I & F & G**	I can measure and mark out the materials I need for my structure. I can finish off my work so it looks neat and tidy.	I can select materials that are strong. I can measure and mark out materials with care and use safe ways of cutting it, including using a junior hacksaw. I use a range of joins. I can modify materials through the use of tools. The materials I use are appropriate for the intended outcome and help my product to function as planned. I can make structures stronger by folding, joining or by shape (columns, triangles).	I can use scoring, and folding to shape materials accurately. I can make accurate cuts (scissors, snips, saw). I can accurately make holes (punch, drill). My methods of working are precise so that products have a high-quality finish. I can join materials to make products using both permanent and temporary fastenings. I can shape my product carefully, using techniques and tools that lead to a high-quality finish. I can use my art skills to apply texture or design to my product. I can design a product that uses both electrical and mechanical components. I can ensure my product has an aesthetic finish so that a user will find it both useful and attractive. I know the application of mechanisms to create movement.	I can measure using mm and then scoring, and folding to shape materials accurately with a focus on precision. I can create joins which are strong and stable, giving extra strength to my products. I can make cuts (scissors, snips, saw) accurately and reject pieces that are not accurate and improve my technique. I can apply a high-quality finish (e.g. using carving, paint, glaze, varnish or other finishes). I know that my product may need further improvement as the materials changes as it dries or when it is heated (e.g. kiln or oven) I can use my hands and other tools to mould materials into accurate shapes. I can explore mechanical movement using hydraulics and pneumatics. I can chose components that can be controlled by switches or IT equipment I can use simple circuits to either illuminate or create motion.	I can make very careful and precise measurements so that it joins, holes and openings are in exactly the right place. I can ensure that edges are finished by sometimes adding other materials (e.g. edging strips). I can carefully hide some joins for aesthetic effect. I can select materials based on the final finished product's use. My products have a high degree of precision and do the intended job well (e.g. a handle on a cup is designed to be an insulator). My products are carefully finished to add extra appeal. This sometimes includes the addition of other materials (e.g. container for a wax candle). I can create precise electrical connections and use my science skills (resistance, batteries, in series or parallel, variable resistance to dim lights or control speed) to alter the way my electrical products behave. I can use other DT skills to create housing for my mechanical components

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Design Technology and Art & Design Curriculums in EYFS

Expressive Arts and Design (educational programme) creating with materials: The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear, and participate in is crucial for developing their understanding, self-expression, vocabulary, and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to, and observe

Skills and knowledge (Fluid across FS1 FS2)	What does this look like in provision/adult interactions?	Transition to KS1	Characteristics of effective learning
- Notice patterns with strong contrasts and be attracted by patterns resembling the human face - Start to make marks intentionally (0-3)	- Ensure that the physical environment includes objects and materials with different patterns, colours, tones and textures for babies and young children to explore. - Offer a wide range of different materials and encourage children to make marks in different ways e.g. in cornflour, place hands and feet in paint	- I respond to ideas and starting points (Art)	Children in EYFS learn at different rates and abilities through: • **Playing and exploring** – children investigate and experience things, and 'have a go'. • **Active learning** – children concentrate and keep on trying if they encounter difficulties and enjoy achievements. • **Creating and thinking critically** – children have and develop their own ideas, make links between ideas, and develop strategies for doing things
- Explore paint, using fingers and other parts of body as well as brushes and tools - Express ideas and feelings through making marks - Explore different materials, using senses - Use imagination as they consider what they can do with materials - Make simple models which express their ideas (0-3)	- Provide a wide range of found materials ('junk') as well as blocks, clay, soft wood, card, offcuts of fabrics and materials with different textures. - Opportunities to use appropriate tools and joining methods for the materials offered.	- I can describe textiles by the way they feel (DT) - I can make a structure (DT) - Enjoys using graphic tools, fingers, hands, chalks etc (Art) - Use and begin to control a range of media (Art) - I can build construction using a variety of objects (Art)	
- Explore different materials freely, to develop their ideas about how to use them and what to make (3-4)	- Offer opportunities to explore scale e.g., long strips of wallpaper, child size boxes, different surfaces to work on e.g., paving, floor, tabletop, or easel Listen and understand what children want to create before offering suggestions. - Outdoor mark making on a larger scale e.g., paint brushes and powder paint, making own paintbrushes out of twigs and leaves.	- I can measure, mark out and cut fabric (DT) - I can join fabric using glue (DT) - Simple pictures by printing from objects such as fruit (Art) - I can develop simple patterns by using objects (Art) - I can make my own printing blocks (Art)	
- Develop own ideas and decide which materials to use - Join different materials and explore different textures - Create closed shapes with continuous lines. (3-4)	- Encourage them to develop their own creative ideas, give real life props or clip art around interests to inspire and ignite curiosity. - Encourage children to draw from their imagination and observation. - Using skills planner, add resources that are fluid and progressive to give them opportunity to join different materials e.g., PVA glue (Low level, Split pins, hole punch (high level)	- I understand how textiles can be used to make products (DT) - Produce lines of different thickness and tone using a pencil (Art) - Start to produce different patterns and textures from observations (Art)	
- Use drawing to represent ideas like movement or loud noises - Show different emotions in drawings and paintings - Explore colour and colour mixing (3-4)	- Talk to children about the differences between colours. Help them to explore and refine their colour mixing. - Allow children to have materials so they can mix their own colours e.g. powder paint.	- I can use pictures and words to describe what I want to do (DT) - Recognise and name the primary colours being used. Mix and match colours to different objects (Art) - Explore working with paint on different surfaces (Art)	
- Explore, use and refine a variety of artistic effects to express their ideas (4-5)	- Introduce children to the work of artists from across times and cultures. - Discuss children's responses to what they see. Visit galleries and museums to generate inspiration and conversation about art and artists.	- I can identify the work of a range of artists, craft makers and designers and make links to my own work (Art) - Use drawings to tell a story (Art) - Create accurate more drawings of people (Art)	
- Return and build on their previous learning - Create collaboratively sharing ideas, resources, and skills (4-5)	- Provide opportunities to work together to develop and realise creative ideas. - Encourage them to think about and discuss what they want to make. Discuss problems and how they might be solved as they arise. - Link to Characteristics (thinking and creating critically)	- I can talk about mine and others work (DT) I can how a product works (DT) - I know the features of familiar products (DT) - I think of ideas and with help can put them into practice (DT) - I have altered a textile to make it stronger (DT) - Look and talk about what they have produced describing simple techniques and media (Art)	
- Managing self (DT): Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices. - Fine motor (DT): Use a range of small tools, including scissors, paintbrushes, and cutlery. Begin to show accuracy and care when drawing.	- Talk to children about the importance of eating healthily and brushing their teeth. Consider how to support oral health. For example, some settings use a toothbrushing programme. Talk to children about why it's important to wash their hands carefully and throughout the day, including before they eat and after they've used the toilet.	- I have made a food product (DT) - I understand that I must wash my hands and keep work surfaces clean when preparing food (DT) - I can use knives safely to cut food with help (DT) - I can cut materials using scissors (DT) - Enjoy using a variety of malleable media (Art) - Cut shapes using scissors (Art)	

Early Learning Goals

- Share their creations, explaining the process they have used.
- Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form and function.