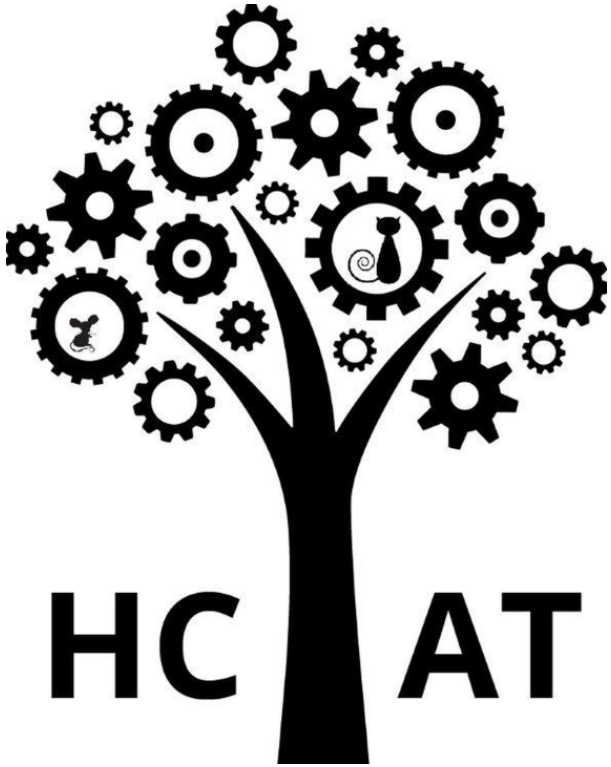


# HCAT

# 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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| | Transition | LKS1 | UKS1 | LKS2 | UKS2 |
|---|---|---|---|---|---|
| **All disciplines** | | | | | |
| **Children talk about their own and other's work and describe how a product works.**<br><br>**INCERTS C & D** | I can talk about mine and others work<br>I can describe how a product works | I can comment on strengths and next steps to improve my own and others work.<br><br>I recognise what I have done well in my work.<br><br>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.<br><br>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<br><br>I adapt and refine my work to reflect the purpose and meaning of the work.<br><br>I identify what is working well and what can be improved<br>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<br><br>I reflect on my designs and develop them bearing in mind the way they will be used<br><br>I test and evaluate my products, showing that I understand the situations my product will have to work<br><br>I am aware that resources may be limited (budget, time, availability) |
| **Children reflect on their design and modify their approach, they then evaluate the process and think about how modifying has led to improvements.**<br><br>**INCERTS E** | | | I identify where my evaluations have led to improvements in my products<br><br>I come up with solutions to problems as they happen<br>My designs improve as I go along. | I reflect on my designs and develop them bearing in mind the way that they will be used<br><br>My product is well finished in a way that would appeal to users<br><br>My product is fit for purpose, and I improve it in response to a users' point of view<br><br>My work incorporates the views of intended users and for the purpose. | I check my work as it develops and modify it as I need to<br><br>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.**<br><br>**Children generate ideas and draw upon various sources of information.**<br><br>**INCERTS C & D** | I know the features of familiar products<br>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<br><br>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<br><br>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 can plan, communicate their ideas and put them into practice.**<br><br>**INCERTS C & D** | I have made a food product. | I can use diagrams and words to describe my dish. | I can make realistic plans to achieve my intended outcome. | I can take the views of users' into account when designing my dish.<br><br>I can produce step-by-step plans. | I can clarify my ideas through discussion, diagrams and modelling.<br><br>I can effectively communicate my ideas with others. |
| **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.**<br><br>**INCERTS - A & B & F & G** | I can use a mixing bowl to prepare a mixture.<br><br>I understand that I have to wash my hands and keep work surfaces clean when preparing food.<br><br>I can use knives safely to cut food (with help). | I can prepare food safely and hygienically and can describe what this means.<br><br>I can describe the properties of food ingredients, taste, smell, texture and consistency.<br><br>I can accurately weigh and measure my ingredients.<br><br>I can describe my food product using its properties: taste, smell, texture and consistency. | I can select ingredients for my food product.<br><br>I can work in a safe and hygienic way.<br><br>I can measure my ingredients by weight or quantity, using scales where appropriate.<br><br>I can present my food product to impress the intended user.<br><br>I can describe my food product in terms of taste, flavour, texture and relate this to the intended purpose of the food.<br><br>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).<br><br>I can ensure my product is well presented and packaged using other DT skills<br><br>I understand that some foods may not be eaten raw, as it is unsafe.<br><br>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.<br><br>I can use proportions and ratio to produce recipes of my food product, scaling up and down for different quantities.<br><br>I can work from my own detailed plans, modifying them where appropriate. |

| | Transition | LKS1 | UKS1 | LKS2 | UKS2 |
|---|---|---|---|---|---|
| **Textiles** | | | | | |
| **Children can generate ideas and plan what to do next, based on experience of working with materials and components.**<br><br>**Children generate ideas and draw upon various sources of information.**<br><br>**INCERTS C & D** | I know the features of familiar products I think of ideas and with help, can put them into practice<br><br>I understand how textiles can be used to make products. | I can generate ideas and plan what to do next, based on what I know about materials and components.<br><br>I understand that textiles have different properties such as; touch, insulation, texture and waterproof.<br><br>I can select the appropriate textile for an intended outcome. | I can generate ideas and recognise that my designs have to meet a range of differing needs.<br><br>I can consider the order of my work, choosing appropriate tools, equipment, materials, components and techniques. | I can generate ideas by collecting and using information. | I can draw upon and use various sources of information. |

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| **Children communicate their ideas through pictures and words to communicate their own ideas.**<br>***Labelled sketches, words and models***<br><br>***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<br><br>I can ensure and select materials with cost and workability in mind. |
| **Children select and work with a range of tools and materials with some accuracy, modifying where appropriate.**<br>**Children pay attention to quality finish and to functions.**<br><br>**INCERTS H & F & G** | I can measure, mark out and cut fabric.<br><br>I can join fabric using glue.<br><br>I can describe textiles by the way they feel.<br><br>I have altered a textile to make it stronger. | I use accurate measurements in cm.<br><br>I use scissors precisely when cutting out.<br><br>I join textiles using glue, staples, tying or a simple stitch.<br><br>I have made a textile product that has a good finish and can do the job it was made for. | I can select the appropriate textile(s) for my product.<br><br>I can use sharp scissors accurately to cut textiles.<br><br>I know that the texture and other properties of materials affect my choice.<br><br>I can combine materials to add strength or visual appeal.<br><br>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.<br><br>I can ensure my textile products include structural changes such as plaiting or weaving to create new products such as rope, belts, bracelets etc.<br><br>I confidently select appropriate textiles thinking about my final outcome.<br><br>I begin to combine art skills I have looked at previously to add texture and colour to my work.<br><br>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<br><br>My products have an awareness of commercial appeal.<br><br>I can experiment with a range of materials until I find the right mix of affordability, appeal and appropriateness for the job<br><br>I can combine art skills to add colour and texture to my work.<br><br>I can mark out using my own patterns and templates.<br><br>I can join textiles using art skills of stitching, embroidering and plaiting to make a durable and desirable product. |

| | **Transition** | **LKS1** | **UKS1** | **LKS2** | **UKS2** |
|---|---|---|---|---|---|
| **Structures** | | | | | |
| **Children can generate ideas and plan what to do next, based on experience of working with materials and components.**<br><br>**Children generate ideas and draw upon various sources of information.**<br><br>**INCERTS C & D** | I know the features of familiar products.<br><br>I can think of ideas and with help, can put them into practice. | I can think of ideas and plan what to do next, based on what I know about materials and components.<br><br>I know how to make structures stronger by folding, joining or by shape (columns, triangles). | | | |
| **Children can plan, communicate their ideas and put them into practice.**<br><br>**INCERTS C & D** | I can make a structure. | I can use models, pictures and words to describe my design. | | | |

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| **Children communicate their ideas through pictures and words to communicate their own ideas.**<br>***Labelled sketches, words and models***<br><br>***LKS1-*** *Children select appropriate tools, techniques and materials explaining their choices.*<br><br>***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. | | | |
| **Children select and work with a range of tools and materials with some accuracy, modifying where appropriate.**<br>**Children pay attention to quality finish and to functions.**<br><br>**INCERTS I & F & G** | I can measure and mark out the materials I need for my structure.<br><br>I can finish off my work so it looks neat and tidy. | I can select materials that are strong.<br><br>I can measure and mark out materials with care and use safe ways of cutting it, including using a junior hacksaw.<br><br>I use a range of joins.<br><br>I can modify materials through the use of tools. | | | |

| | **Transition** | **LKS1** | **UKS1** | **LKS2** | **UKS2** |
|---|---|---|---|---|---|
| **Mechanisms** | | | | | |
| **Children can generate ideas and plan what to do next, based on experience of working with materials and components.**<br><br>**Children generate ideas and draw upon various sources of information.**<br><br>**INCERTS C & D** | I know the features of familiar products.<br><br>I think of ideas and with help, can put them into practice.<br><br>I can describe the properties of the materials I have used.<br><br>I can explore how moving objects work. | I can generate ideas and plan what to do next, based on what I know about materials and components.<br><br>I know that my product needs to be made from materials that are suitable for the job. | | | |
| **Children can plan, communicate their ideas and put them into practice.**<br><br>**INCERTS C & D** | I have made a product that moves using a turning mechanism (e.g. wheels, winding) or a lever or a hinge (to make a movement). | I can use models, pictures and words to describe my design. | | | |
| **Children select and work with a range of tools and materials with some accuracy, modifying where appropriate.**<br>**Children pay attention to quality finish and to functions.** | I can cut materials using scissors. | I confidently cut materials using scissors with some accuracy and precision.<br><br>I have made a product that creates movement. | | | |

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| **INCERTS K & F & G** | | The materials I use are appropriate for the intended outcome and help my product to function as planned.<br><br>I can join materials together to add strength. | | | |

| | **Transition** | **LKS1** | **UKS1** | **LKS2** | **UKS2** |
|---|---|---|---|---|---|
| **Electrical & mechanical components** | | | | | |
| **Children communicate their ideas through pictures and words to communicate their own ideas.**<br>***Labelled sketches, words and models***<br><br>***LKS1-*** *Children select appropriate tools, techniques and materials explaining their choices.*<br><br>***INCERTS D*** | | | I can clarify my ideas using labelled diagrams and models to communicate the details of my designs. | I can communicate alternative ideas using words, labelled diagrams 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.<br><br>I can 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. |
| **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.**<br><br>**INCERTS K & L & F & G** | | | I can select the most appropriate techniques and tools to make my product.<br><br>I can design a product that uses both electrical and mechanical components.<br><br>I can ensure my product has an aesthetic finish so that a user will find it both useful and attractive.<br><br>I know the application of mechanisms to create movement.<br><br>I can combine several components well in my product.<br><br>I can use simple circuits to either illuminate or create motion. | I can explore mechanical movement using hydraulics and pneumatics.<br><br>I can chose components that can be controlled by switches or ICT equipment. | I can work from my own detailed plans, modifying them where appropriate<br><br>I can create precise electrical connections.<br><br>I can use other DT skills to create housing for my mechanical components. |
| **Children talk about their own and other's work and describe how a product works.** | | | I can talk about my own work and describe how it works. | I can confidently discuss about my own work and explain how it works. | I can give detailed explanations about my work and can compare it to others, evaluating strengths and weaknesses. |

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| **INCERTS E** | | | I can talk about others work and how it works. | I can confidently discuss others work and consider how it works. | |

| | **Transition** | **LKS1** | **UKS1** | **LKS2** | **UKS2** |
|---|---|---|---|---|---|
| **Mouldable 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.**<br><br>**INCERTS H & F & G** | | | I can use appropriate mouldable materials suitable for the purpose of my product.<br><br>I can shape my product carefully, using techniques and tools that lead to a high-quality finish.<br><br>I can use my art skills to apply texture or design to my product.<br><br>I can describe the qualities of my material and say how it will be the most suitable choice. | I can use suitable mouldable materials selected for the purpose of my product.<br><br>I can apply a high-quality finish (e.g. using carving, paint, glaze, varnish or other finishes).<br><br>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)<br><br>I can use my hands and other tools to mould materials into accurate shapes. | I can work from my own detailed plans, modifying them where appropriate.<br><br>I can select materials based on the final finished product's use.<br><br>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).<br><br>My products are carefully finished to add extra appeal. This sometimes includes the addition of other materials (e.g. container for a wax candle). |

| | **Transition** | **LKS1** | **UKS1** | **LKS2** | **UKS2** |
|---|---|---|---|---|---|
| **Stiff & flexible sheet 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.**<br><br>**INCERTS I & F & G** | | | I can use scoring, and folding to shape materials accurately.<br><br>I can make accurate cuts (scissors, snips, saw).<br><br>I can accurately make holes (punch, drill).<br><br>My methods of working are precise so that products have a high-quality finish.<br><br>I can join materials to make products using both permanent and temporary fastenings. | I can measure using mm and then scoring, and folding to shape materials accurately with a focus on precision.<br><br>I can create joins which are strong and stable, giving extra strength to my products.<br><br>I can make cuts (scissors, snips, saw) accurately and reject pieces that are not accurate and improve my technique. | I can work from my own detailed plans, modifying them where appropriate.<br><br>I can make very careful and precise measurements so that it joins, holes and openings are in exactly the right place.<br><br>I can ensure that edges are finished by sometimes adding other materials (e.g. edging strips).<br><br>My product is well received by intended users.<br><br>I can carefully hide some joins for aesthetic effect. |