Design and Technology

National Curriculum

KS1 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.

Cooking and Nutrition

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

KS2 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
- 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.

Design and Technology Core Knowledge

Foundation Stage	Y1	Y2	Y3	Y4	Y5	Y6
Expressive Arts • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used. **Physical Development** • Hold a pencil effectively in preparation for fluent writing – using the tripod	• Use own ideas to design something • Describe how their own idea works • Design a product which moves • Explain to someone else how they want to make their product • Use own ideas to make something • Make a product which moves • Choose appropriate resources and tools • Describe how something works • Explain what works well and not so well in the model they have made	• Think of an idea and plan what to do next • Explain why they have chosen specific textiles • Choose tools and materials and explain why they have chosen them • Join materials and components in different ways • Measure materials to use in a model or structure • Explain what went well with their work • Make a model stronger and more stable • Use wheels and axles, when	• Prove that a design meets a set criteria • Design a product and make sure that it looks attractive • Choose a material for both its suitability and its appearance • Follow a step-by-step plan, choosing the right equipment and materials • Select the most appropriate tools and techniques for a given task • Make a product which uses both electrical and mechanical components	• Use ideas from other people when designing • Produce a plan and explain it • Persevere and adapt work when original ideas do not work • Communicate ideas in a range of ways, including by sketches and drawings which are annotated • Know which tools to use for a particular task and show knowledge of handling it • Know which material is likely to give the best outcome	• Come up with a range of ideas after collecting information from different sources • Produce a detailed step-by-step plan • Explain how a product will appeal to a specific audience • Design a product that requires pulleys or gears • Use a range of tools and equipment competently • Make a prototype before making a final version • Make a product that relies on pulleys or gears	• Use market research to inform plans and ideas • Follow and refine original plans • Justify planning in a convincing way • Show that culture and society is considered in plans and designs • Know which tool to use for a specific practical task • Know how to use the tool correctly and safely • Know what each tool is used for • Explain why a specific tool is best for a specific action

grip in almost all cases. • Use a range of small tools, including scissors, paintbrushes and cutlery. • Begin to show accuracy and care when drawing.	• Make their own model stronger • Cut food safely	appropriate to do so • Weigh ingredients to use in a recipe • Describe the ingredients used when making a dish or a cake	• Work accurately to measure, make cuts and make holes • Explain how to improve a finished model • Know why a model has or has not been successful • Know how to strengthen a product by stiffening a given part or reinforce a part of the structure • Use a simple IT program within the design • Describe how food ingredients come together • Weigh out ingredients and follow a given recipe to create a dish • Talk about which food is healthy and which food is not • Know when food is ready for harvesting	• Measure accurately • Evaluate and suggest improv. for designs • Evaluate products for both their purpose and appearance • Explain how the original design has been improved • Present a product in an interesting way • Links scientific knowledge by using lights, switches or buzzers • Use electrical systems to enhance the quality of the product • Use IT where appropriate and add to the quality of the product • Know how to be both hygienic and safe when using food • Bring a creative element to the food product being designed	• Suggest alternative plans; outlining the positive features and draw backs • Evaluate appearance and function against original criteria • Link scientific knowledge to design by using pulleys or gears • Use more complex IT to help enhance the quality of the product produced • Be both hygienic and safe in the kitchen • Know how to prepare a meal by collecting the ingredients in the first place • Know which season various foods are available for harvesting	• Know how to test and evaluate designed products • Explain how products should be stored and give reasons • Evaluate product against clear criteria • Use electrical systems correctly and accurately to enhance a given product • Know which IT product would further enhance a specific product • Use knowledge to improve a made product by strengthening, stiffening or reinforcing • Explain how food ingredients should be stored and give specific reasons • Work within a budget to create a meal • Understand the difference between a savoury and sweet dish

Design and Technology Disciplinary Knowledge						
Aspect	Y1	Y2	Y3	Y4	Y5	Y6
Planning, Knowledge and Evaluation						
Designing	1.1 Draw a simple picture of an intended design with basic labelling.	2.1 Produce detailed, labelled drawings or models of products.	3.1 Share ideas through words, labelled sketches and models, recognising that designs have to meet a range of needs, including being fit for purpose.	4.1 Collect information from a number of different sources and use this information to inform design ideas in words, labelled sketches, diagrams and models, keeping in mind fitness for purpose and the end user.	5.1 Use various sources of information, clarifying/sharing ideas through discussion, labelled sketches, cross-sectional diagrams and modelling, recognising that ideas have to meet a range of needs.	6.1 Develop detailed criteria for designs for products aimed at particular individuals or groups, sharing ideas through cross-sectional end exploded diagrams, prototypes and pattern pieces.
Using ICT to aid design	1.2 Use ICT packages to create a simple plan for a design.	2.2 Use ICT packages to create a labelled design or plan	3.2 Use IT packages to create a labelled design or plan, in detail.	4.2 Use ICT packages to create alternatives for an initial design.	5.2 Use CAD and CAM packages to suggest alternative design ideas and explain their ideas and intentions.	6.2 Use CAD/CAM packages to design moving parts of a design.
Working from plans	1.3 With help, put ideas into practice	2.3: Think of ideas and plan what to do next, based on their experience of working with materials and components.	3.3 Make realistic plans, identifying processes, equipment and materials.	4.3 Make realistic, step by step plans, reflecting on designs as the product develops.	5.3 Work from own detailed plans, modifying them where appropriate.	6.3 Check work as it develops and modify their approach in the light of progress.
Opinion and influence	1.4 Describe others' work, including work by professional craftspeople and	2.4 Describe similarities and differences between own and others' work	3.4 Compare and contrast great bridge designs, explaining why a particular	4.4 Describe the work of a favourite fashion designer and explain	5.4 Research the work done by textile artists and say what they like about a piece,	6.4 Research cultural traditions and evidence their

	designers and say what they like and dislike about it.	including work by professional craftspeople and designers.	design is significant in engineering history.	why they like his/her designs.	identifying techniques and materials used in creating it and the aesthetic value.	influence on their own work.
Existing Product Evaluation	1.5 Describe how an existing product works (e.g. 'the toy moves when I turn the handle').	2.5 Investigate a range of existing products and say if they do what they are supposed to do.	3.5 Investigate the design features (including identifying components or ingredients) of familiar existing products.	4.5 Explain how an existing product is useful to the user.	5.5 Investigate the design features (including identifying components or ingredients) of a familiar existing product in the context of the culture or society in which it was designed or made.	6.5 Explain the form and function of familiar existing products.
Evaluation	1.6 Talk about their own and others' work identifying strengths and weaknesses.	2.6 Explain how closely, finished products, meet their design criteria and say what they could do better in the future.	3.6 Suggest improvements to products made and describe how to implement them (taking the views of others into account).	4.6 Identify what has worked well and what could be improved, evidencing and explaining the results of research.	5.6 Text and evaluate products against a detailed design specification and make adaptations as they develop the product.	6.6 Demonstrate modifications made to a product, as a result of ongoing evaluation, by themselves and others.
History and culture	1.7 Order products and designs chronologically and begin to explain reasons why they are ordered in that way.	2.7 Describe why a design, building or designer is important.	3.7 Explain the impact of a design or designers on design history and how this has helped to shape the world.	4.7 Explain how fashions and fabrics have changed over time and how this has affected fashion.	5.7 Create a timeline to sequence the development of a design over time and describe how technology has influenced it.	6.7 Describe how an individual in the field of design and technology has helped shape the world.

Mill Hill Community Primary School
Design and Technology Knowledge

Making, Using and Understanding						
Tools	1.8 Select and explain why they have chosen a particular tool for a task.	2.8: Use tools safely for cutting and joining materials and components.	3.8 Select the appropriate tools and explain choices.	4.8 Analyse the potential of a range of tools for a task and use them with precision.	5.8 Name and select appropriate told for a task and use them with precision.	6.8 Use more complex tools with increasing accuracy.
Materials	1.9 Select and explain their choice of materials, sometimes with help.	2.9: Choose appropriate materials and suggest ways of manipulating them to achieve a desired effect.	3.9 Plan which materials will be needed for a task and explain why.	4.9 Choose from a range of materials, showing an understanding of their different characteristics.	5.9 Select and combine materials with precision.	6.9 Choose the best materials for a task, showing an understanding of their working characteristics.
Health and Safety	1.10 Explain how to keep safe during a practical task.	2.10: Work safely and hygienically in construction and cooking activities.	3.10 Follow health and safety rules for cooking and baking activities.	4.10 Follow health and safety rules when working with materials and substances.	5.10 Select and name appropriate tools for specific jobs and demonstrate how to use them safely.	6.10 Demonstrate how their products take into account the safety of the user.
Repair and maintenance	1.11 Explain how they would fix simple products.	2.11 Cut, measure, form and shape materials to fix or repair something, explaining objectives.	3.11 Try an alternative way of fixing something, if their first attempt isn't successful.	4.11 Describe how a product could be made better, stronger or more sustainable.	5.11 Recycle, repair and mend old clothes/tools and explain why this is a good idea.	6.11 Paint, glue, nail and sand to rejuvenate a damaged, faulty or old object.
Textiles	1.12 Cut out shapes from a range of fabrics and papers.	2.12: Join fabrics using running stitch, glue, staples, over sewing and tape.	3.12 Create a simple pattern for a design.	4.12 Use a simple pattern to create a life-sized item of clothing.	5.12 Create a 3D product using a range of materials and sewing techniques.	6.12 Combine fabrics to create more useful properties and make a product of high quality, checking for snags and glitches.

Mill Hill Community Primary School
Design and Technology Knowledge

Card making	1.13 Fold, tear and cut paper and card.	2.13: Create simple hinges and pop-ups using card.	3.13 Cut slots in card and create nets.	4.13 Use more complex pop-ups.	5.13 Combine materials with temporary or fixed joints.	6.13 Combine materials with moving joints.
Cutting	1.14 Cut accurately and safely with scissors	2.14: Cut wood/dowel using a bench hook and hacksaw.	3.14 Measure and mark wood/dowel.	4.14 Cut internal shapes	5.14 Cut safely and accurately to a marked line.	6.14 Use a craft knife, cutting mat and safety ruler with 1:1 supervision if needed.
Joining	1.15 Join appropriately, using glue or tape.	2.15: Attach features to a vehicle (e.g. an axle and wheels or a sail and rudder). Join appropriately, with flue and/or tape, for different materials and situations.	3.15 Join fabrics using a running stitch.	4.15 Use a glue gun with close supervision (one to one)	5.15 Use a glue gun with close supervision.	6.15 Join materials, using the most appropriate method for the materials or purpose.
Structures	1.16 Build simple structures.	2.16 Improve structures by making them stronger, stiffer and more stable.	3.16 Create a shell or frame structure using diagonal struts to strengthen.	4.16 Prototype and build frame and shell structures, showing awareness of how to strengthen, stiffen and reinforce.	5.16 Build a framework using a range of materials (e.g. wood, card and corrugated plastic) to support mechanisms.	6.16 Select the most appropriate materials and frameworks for different structures, explaining what makes them strong.
Mechanisms	1.17 Use wheels, axels, levers and sliders.	2.17: Create and use wheels and axles, levers and sliders.	3.17 Create and use simple gears, pulleys, cams, levers and linkages.	4.17 Use pulleys, levers and linkages in their products.	5.17 Use cams or gears in their products	6.17 Select the most appropriate mechanical system for a particular purpose.
Electricity	1.18 Identify and talk about products that	2.18: Create working circuits to light a bulb or work a buzzer.	3.18 Build models, incorporating circuits,	4.18 Build models incorporating motors.	5.18 Build models, incorporating switches to turn on and off.	6.18 Design products incorporating the

	use electricity to make them work.		with buzzers and bulbs.		most appropriate electrical systems.
ICT	1.19 Input random control instructions to simple devices for an unplanned outcome (e.g. making Roamer move).	2.19: Input a sequence of instructions to a device for a planned outcome (e.g. making Roamer move).	3.19 Evaluate their own programme, refine and improve it.	4.19 Create a solution to a problem using a control output device that has a sequence of events to activate it.	5.19 Monitor and control more than one output, in response to changes.	6.19 Develop, try out and refine sequences of instructions to effectively monitor, measure and control events.
Preparing and cooking food	1.20 Measure and weigh food items using non-standard measures (e.g. spoons and cups)	2.20: Cut, peel, grate and chop a range of ingredients to make dishes from other countries.	3.20 Combine a variety of ingredients using a range of cooking techniques.	4.20 Measure and weigh ingredients appropriately to prepare and cook a range of savoury dishes.	5.20 Combine food ingredients approximately (e.g. kneading, rubbing in and mixing)	6.20 Use appropriate tools and equipment, weighing and measuring with scales.
Nutrition	1.21 Identify the main food groups, including fruit and vegetables.	2.21: Recognise the need for a variety of foods in a diet.	3.21 Describe what a balanced diet is.	4.21 Make healthy eating choices and explain why.	5.21 Evaluate meals and consider if they contribute towards a balanced diet.	6.21 Plan how they can have a healthy/affordable diet.
Origins of food	1.22 Identify the source for common foods.	2.22: Explain where the food they eat comes from (e.g. by referring to countries, counties, animals and plants).	3.22 Identify food which comes from the UK and other countries in the world.	4.22 Explain some of the processes that foods go through to preserve/make them more appealing.	5.22 Explain what times of year particular foods are in season.	6.22 Explain how ingredients were grown, reared, caught and processed.