



Design & Technology

Progression of Skills

National Curriculum Content

Purpose of Study & Aims

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.

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.

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

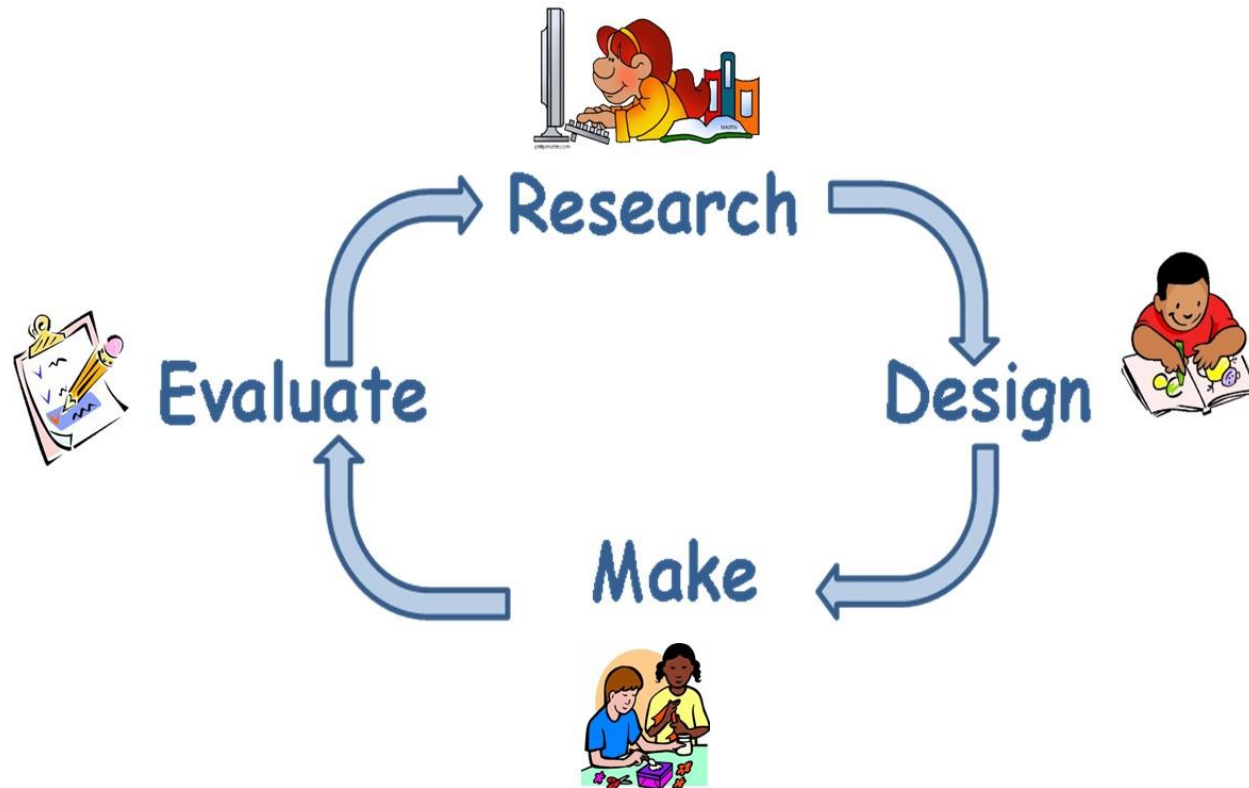
Technical knowledge

- 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.

Design Technology at Newport

At Newport the teaching of Design Technology inspires children to create a range of structures, mechanisms, textiles, electrical systems and food products that serve a real-world purpose.

Teaching of Design Technology follows the following sequence at Newport:



Knowledge, Skills and Understanding breakdown for Design Technology

EYFS DT				
Developing planning & communicating		Working with tools & materials		Evaluating processes and products
- Can children use what they have learned about media and materials in original ways, thinking about uses and purposes? - Can they represent their own ideas, thoughts and feelings through design and technology, art, music		Can children safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function?		Can they talk about the plans they have made to carry out activities and what they might change if they were to repeat them?
Cooking & Nutrition	Textiles	Mechanisms	Use of materials	Construction
- Do they know and choose healthy options? - Can they use cutlery? - Do they bake and explore ingredients for a variety of recipes? - Can they tell you what happens when something goes into the oven? - Can they manage their own personal hygiene	Can they use a variety of threading materials? e.g. threading cotton reels using tweezers etc	Can they join materials / resources in different ways?	- Can they develop their own ideas? - Can they decide which resource / material to use? - Can they explore the textures, movement, feel and look of different media and materials?	- Can they combine shapes to make new ones? - Can they use one handed tools and equipment? - Can they construct with a purpose in mind using a variety of resources?

Year 1 DT			
Developing planning & communicating		Working with tools & materials	Evaluating processes and products
• Can they think of some ideas of their own? • Can they explain what they want to do? • Can they use pictures and words to plan?		• Can they use a variety of tools safely for the correct purpose? • Do they know which tools they are using?	• Can they describe how something works? • Can they talk about their own work and things that other people have done?
Cooking & Nutrition	Mechanisms	Use of materials	Construction
• Do they understand why they need fruit and veg • Can they cut food safely? Can they describe the texture of foods? • Do they wash their hands and make sure that surfaces are clean?	• Can they make a product which moves? • Can they cut materials using scissors? • Can they describe the materials using different words? • Can they say why they have chosen moving parts?	• Can they make a structure/model using different materials? • Is their work tidy? • Can they make their model stronger if it needs to be?	• Can they talk with others about how they want to construct their product? • Can they select appropriate resources and tools for their building projects? • Can they make simple plans before making objects, e.g. drawings, arranging pieces of construction before building?

Year 2 DT				
Developing planning & communicating		Working with tools & materials		Evaluating processes and products
- Can they think of ideas and plan what to do next? - Can they give a reason why these are best? - Can they describe their design by using pictures, diagrams, models and words?		- Can they join things (materials/ components) together in different ways? - Can they choose the best tools and materials?		- What went well with their work? - If they did it again, what would they want to improve?
Cooking & Nutrition	Textiles	Mechanisms	Use of materials	Construction
- Can they describe the properties of the ingredients they are using? - Can they explain what it means to be hygienic? - Are they hygienic in the kitchen?	- Can they measure textiles? - Can they join textiles together to make something? - Can they cut textiles? - Can they explain why they chose a certain textile?	- Can they join materials together as part of a moving product? - Can they add some kind of design to their product?	- Can they measure materials to use in a model or structure? - Can they join material in different ways? - Can they use joining, folding or rolling to make it stronger?	- Can they make sensible choices as to which material to use for their construction? - Can they develop their own ideas from initial starting points? - Can they incorporate some type of movement into models?

Year 3 DT		
Developing planning & communicating	Working with tools & materials	Evaluating processes and products
• Can they show that their design meets a range of requirements? • Can they put together a step-by-step plan which shows the order and also what equipment and tools they need? Is it realistic? • Can they describe their design using an accurately labelled sketch and words?	• Can they use a range of equipment and tools accurately?	• What did they change which made their design even better?
Cooking & Nutrition	Textiles	Materials
• Can they choose the right ingredients for a product? • Can they use equipment safely? • Can they make sure that their product looks attractive? • Can they describe how their combined ingredients come together? • Can they set out to grow plants such as cress and herbs from seed with the intention of using them for their food product?	• Can they join textiles of different types in different ways? • Can they choose textiles both for their appearance and also qualities?	• Do they use the most appropriate materials? • Can they work accurately to make cuts and holes? • Can they join materials? • Do they select the most appropriate materials? • Can they use a range of techniques to shape and mould? • Do they use finishing techniques?

Year 4 DT			
Developing planning & communicating		Working with tools & materials	Evaluating processes and products
- Can they come up with at least one idea about how to create their product? - Do they consider the ideas of others when designing? - Can they produce a plan and explain it to others?		- Can they tell if their finished product is going to be good quality? - Are they conscience of the need to produce something that will be liked by others? - Can they show a good level of expertise when using a range of tools and equipment?	- Have they thought of how they will check if their design is successful? - Can they begin to explain how they can improve their original design? - Can they evaluate their product, thinking of both appearance and the way it works?
Cooking & Nutrition	Mechanisms	Electrical Systems	Materials
- Can they describe what they do to be both hygienic and safe? - How have they presented their product well?	- Do they select the most appropriate tools and techniques to use for a given task? - Can they make a product which uses mechanical components? - Can they refine their product after testing it?	- Can they make s product which uses electrical components? - Can they use a simple circuit? - Can they use a number of components? - Can they incorporate a switch into their product?	- Can they measure carefully to make sure they have not made mistakes? - How have they attempted to make their product strong? - Do they work at their product even though their original idea might not have worked?

Year 5 DT		
Developing planning & communicating	Working with tools & materials	Evaluating processes and products
- Can they come up with a range of ideas after they have collected information? - Do they take a user's view into account when designing? - Can they produce a detailed step-by-step plan? - Can they suggest some alternative plans and say what the good points and drawbacks are about each?	- Can they explain why their finished product is going to be of good quality? - Can they explain how their product will appeal to the audience? - Can they use a range of tools and equipment expertly?	- Do they keep checking that their design is the best it can be? - Do they check whether anything could be improved? - Can they evaluate appearance and function against the original criteria?
Cooking & Nutrition	Textiles	Materials
- Do they know what to do to be hygienic and safe? - Have they thought what they can do to present their product in an interesting way?	- Do they think what the user would want when choosing textiles? - How have they made their product attractive and strong? - Are their measurements accurate enough to ensure that everything is precise? - Can they make up a prototype first? - Can they use a range of joining techniques?	- Are they motivated enough to refine and improve their product? - Do they persevere through different stages of the making process? - Are their measurements accurate enough to ensure that everything is precise? - How have they ensured that their product is strong and fit for purpose? - Can they refine their product after testing it?

Year 6 DT			
Developing planning & communicating		Working with tools & materials	Evaluating processes and products
• Can they use a range of information to inform their design? • Can they use market research to inform plans? • Can they work within constraints? • Can they follow and refine their plan if necessary? • Can they justify their plan to someone else? • Do they consider culture and society in their designs?		• Can they use tools and materials precisely? • Do they change the way they are working if needed?	• How well do they test and evaluate their final product? • Is it fit for purpose? • What would improve it? • Would different resources have improved their product? • Would they need more or different information to make it even better?
Cooking & Nutrition	Textiles	Mechanisms	Materials
• Can they explain how their product should be stored with reasons? • Can they work within a budget?	• Have they thought about how their product could be sold? • Have they given consideration to how / what would improve their product even more? • Can they work within a budget?	• Can they make a product with a mechanical device? • Does it move back / forth / up / down as their design intended? • Is their product fit for purpose? • If not, how do they rectify this?	• Did they consider the use of the product when selecting materials? • Does their product meet all design criteria? • How have they ensured that their work is precise and accurate? • Can they hide joints so to improve the look of their product?