Design Technology

National Curriculum 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.

Expected covered content from Key Stage 1

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.

Design Technology

Actual coverage in Key Stage 2

	When designing and making, pupils should be taught to:	Year 3	Year 4	Year 5	Year 6
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	T1 - ThAF!, T4 - UTC	T1 - LS	T1 - MC, T3 - YNI	T4 - GW
	• generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	T1 - ThAF!, T4 - UTC	T1 - LS, T4 - PoP	T1 - MC, T3 - YNI	T4 - GW, T6 - IHaD
Make	• select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately	T3 - AvS, T4 - UTC, T6 - CFWM:Af	T1 - LS, T4 - PoP	T1 - MC, T3 - YNI, T6 - CFWM:Am	T1 - AwoBI
	• 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	T4 - UTC, T6 - CFWM:Af	T1 - LS, T4 - PoP	T1 - MC, T3 -YNI	T4 - GW, T6 - IHaD
Evaluate	• investigate and analyse a range of existing products	T4 - UTC	T1 - LS, T4 - PoP	T1 - MC, T3 - YNI	T4 - GW
	• evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	T4 - UTC	T1 - LS	T1 - MC, T3 - YNI	
	• understand how key events and individuals in design and technology have helped shape the world				T1 - AwoBI
Technical knowledge	• apply their understanding of how to strengthen, stiffen and reinforce more complex structures			T6 - CFWM:Am	
	• understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	T1 - ThAF!	T3 - L&O		T1 - AwoBI
	• understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]			T4 - FoB	T1 - AwoBI, T3 - WotW
	• apply their understanding of computing to program, monitor and control their products			T4 - FoB	T3 - WotW

Design Technology

	Pupils should be taught to:	Year 3	Year 4	Year 5	Year 6
Cooking & nutrition	• understand and apply the principles of a healthy and varied diet		T4 - PoP		
	• prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques	T6 - CFWM:Af			
	• understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	T6 - CFWM:Af			

Design Technology

Knowledge Building

Food Technology

Food technology is an area that focuses on the production, research, development, preservation and quality control of food products. It features a range of techniques in food preparation, as well as recognising the need for hygiene when working with food. Pupils will know where food comes from, how to prepare food safely, with and without a heat source, and finally explore different techniques used to make a wider range of dishes. There is a link with science here

Users and Purposes

In design technology, **users** are defined by the people who will use the product that is being designed. **Purpose** relates to designing solutions to improve people's lives. These two components need to work harmoniously together in order to create a design, and then, ultimately, a product that suits both. By making pupils aware of these two aspects, they can see how design technology evolves and develops until they recognise that some designs have impact beyond their intended **user and purpose**.

Product Research

Product research is the process of deciding which new products will be successful and then seeing how they could be developed. It can also involve looking at any existing similar products. Initially research is very basic in terms of like and dislike, but deeper research looks into aesthetics, functionality and the materials used. Pupils will expand their research skills to include these different areas and, ultimately, be able to link them to **users and purposes.**

Design Technology Vocabulary

The language of design technology can be broken down into different categories such as: the language of **design** e.g. draw, sketch, user, purpose; the language of **making**, for example, tools, equipment, materials and the language of **evaluation,** including discussion about the product, asking questions about its useability, reviewing and checking.

Product Features

Product features are aspects that make a product useful, fit for purpose and, sometimes, unique. They are attributes that appeal to **users** and make that particular product distinct. When designing a product, the features need to appeal to users, need to fulfil the purpose of the product and be influenced by research into products that may do the same thing. This aspect has strong links with **users and purposes** and **product research**. Pupils will learn how to identify features, discuss how useful they are and then explore how **product features** they actually benefit the product in terms of performance and usability.

Invention and Development

Design technology can be looked as two strands: **invention and development. Invention** is the process of thinking and making new products. The people who do this are **inventors**. **Development** looks at products and ideas that already exist and finds ways of making them better. It is important that pupils recognise that adapting and innovating designs / products is key in making new things. Initially, pupils will find out about well-known inventors and how their products and designs have improved life for others. They will learn about the need for problem-solving skills during the invention process, so that a product can be as functional and usable as possible. Pupils will also find out about copyrighting, trademarks and patenting ideas and products.

Design Technology

End Goals
Adventurers / LKS2
Our aim in teaching design technology in Adventurers is to encourage pupils to make links between purpose, functionality and aesthetics. In this phase, pupils will have the opportunity to design for two more Extraordinaires. These personas require more thought and consideration of their requirements than in Pathfinders. Pupils should know that they need to not only focus on purpose and some key features but now bear in mind how the product looks and feels for their user. They should consider materials that not only work well for construction but look aesthetically pleasing too. The Adventurers phase sees pupils learn some basic cooking skills and recognition of where their food comes from. Pupils should be aware that much of their food comes from overseas and that seasonality is important when trying to source various ingredients. They should know how to prepare food hygienically and cook safely whilst remembering that food, like other products they have designed and made, needs to be presented attractively for people to enjoy. By the end of this phase, pupils should be more confident in evaluating their own work and be able to give more detailed criticism, both positively and negatively. They should understand the importance of problem solving in the invention process and be able to make adjustments to their designs. Pupils should now be able to give some feedback to their peers, suggesting ways they could improve or noting a feature that is particularly well designed.
Navigators / UKS2
Our aim in teaching design technology in Navigators is to embed knowledge and skills from the previous phases with a greater awareness of design in the wider world. Pupils should be aware that products can often have more than one function or purpose and be able to recognise the impact this has on its useability. They should know that there is a clear relationship with the features of a product and the functionality of it. They should ask themselves regularly, does this feature enhance this product? Is this feature necessary to the needs of the end user? The Navigator Extraordinaires are based on real people; a solider and a spaceman, both of whom have very specific requirements and restrictions. Pupils should be able to consider the wider issues these personas have when designing and making their products for them. Thoughts on how versatile their product is and how it could impact on other equipment should be considered. By the end of this phase, pupils should have an awareness of the legalities that comes with designing and making a unique product. They should know the terms of ‘trademark’, ‘patent’, ‘copyright’, ‘brand’ and ‘logo’. They should understand that these terms and processes allow inventors to keep their inventions safe and ensure that they earn the recognition they deserve for a design that is their own work. Additionally, Navigators, should be able to see the links between design technology and other subjects such a science. They should see that their knowledge of electricity, for example, can be put to practical use in technology tasks.

Design Technology

ADVENTURERS (Year 3 & 4)

Knowledge Building					
Food Technology	**Users and Purposes**	**Product Research**	**Design Technology Vocabulary**	**Product Features**	**Invention and Development**
Know how to prepare and cook safely and hygienically, including use of a heat source	Understand the purpose of their product and know which design features will appeal to intended users	Understand the link between choice of materials, functionality and aesthetics	Know the names of a wide range of tools and techniques, including how to employ them	Understand how important performance and appearance are in product design	Understand the role and importance of problem-solving within the invention process

Design Technology Skills Progression – Adventurers Y3&4

Dt21 Generate, develop and explain ideas for products to meet a range of needs
Dt22 Explore ways of meeting design challenge with a food focus using a range of cooking techniques
Dt23 Identify a purpose and establish criteria for a successful product
Dt24 Evaluate work, adapting and improving where appropriate
Dt25 Communicate, design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes
Dt26 Selecting appropriate tools and techniques, name and describe them
Dt27 Measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with some accuracy
D28 Use research to inform their design
Dt29 Explore ways of meeting design challenges with a textile focus
D30 Evaluate work, adapting and improving through the views of others to improve their work
Dt31 Communicate design ideas, in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes
Dt32 Select from and use a range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
Dt33 Join and combine materials and components accurately in temporary and permanent ways
Dt34 Measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with increasing accuracy

Design Technology

Knowledge Progression Term 1 & Term 2

Adventurers 1 / Year 3	Adventurers 2 / Year 4
THAT'S ALL FOLKS - Mechanisms - Levers and Linkages 2 (Term 1) Pupils will embed and build on previous knowledge of how to construct and use levers by integrated them with linkages. They will explore a range of lever and linkage types and their methods of construction. In this second part, pupils will design a 'puppet' with a scissor mechanism that could be used in a stop-motion animation. Thoughtful and considered design is needed in this task. **Skills Development Task** **Concepts** **NC -** 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 **NC -** Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **NC -** Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages) • Design, make and evaluate a prop or model to be used in an animation.	**Lightning Speed (Term 1)** Pupils will be using The Extraordinaires Evil Genius project in this unit. They will be familiar with the initial processes of studying the persona of the user, their needs analysis and what it is they are designing. In Adventurers, pupils will be expected to work through the stages in more detail, for example, when thinking of ways to improve, they will need to analyse a specific feature of their design and describe how it could be made better. Pupils will need to consider how they will make their product not only functional but also look attractive to the user. **Concepts** **NC -** 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 **NC -** Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **NC -** Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately **NC -** 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 **NC -** Investigate and analyse a range of existing products **NC -** Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Design and make a model of a new communications device for the Evil Genius
Lindow Man (Term 2) No Design Technology in this Project **Rocky the Findosaur (Term 2)** No Design Technology in this Project	**Out and About (Term 2)** No Design Technology in this Project **May the Force Be With You (Term 2)** No Design Technology in this Project

Design Technology

Knowledge Progression Term 3 & Term 4

Adventurers 1 / Year 3

Athens v Sparta - Mechanisms – Structures (Term 3)

In Pathfinders, pupils learnt that good design is an importance component in the construction of strong structures. In this unit, pupils will discover how a strong structure and an accurate mechanism can be combined to make a siege weapon. Pupils will need to carefully consider the purpose of their product and include some key features to allow it to work. They will also need to work through processes of problem solving in order to achieve the best firing mechanism.

Skills Development Task

Concepts

NC - Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately

Apply their understanding of how to strengthen, stiffen and reinforce more complex structures

- Design, make and evaluate a siege weapon (trebuchet)

Under The Canopy (Term 4)

Pupils will be using The Extraordinaires Tribal Child project in this unit. They will be familiar with the initial processes of studying the persona of the user, their needs analysis and what it is they are designing. In Adventurers, pupils will be expected to work through the stages in more detail, for example, when thinking of ways to improve, they will need to revisit the user's profile and assess how their design could be made more suitable. Pupils need to think carefully about the materials being used with links to functionality and aesthetics.

Concepts

NC - 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

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

NC - Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately

NC - 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

NC - Investigate and analyse a range of existing products

NC - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

- Design and make a prototype of a new toy for tribal child made of natural materials

Adventurers 2 / Year 4

LAW AND ORDER - Mechanisms - Levers and Linkages 1 (Term 3)

Pupils will embed and build on previous knowledge of how to construct and use levers by integrated them with linkages. They will explore a range of lever and linkage types and their methods of construction. Pupils will use this knowledge by designing and making a celebration card using one of these moving levers. Thoughtful and considered design is needed in this task.

Skills Development Task

Concepts

NC - Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages)

- Construct some of the examples of levers and linkages
- Design, make and evaluate a celebration card that includes a mechanical system. The picture must use levers and linkages

PICTURE OUR PLANET – Textiles (Term 4)

Pupils already have some experience of working with textiles and combining two pieces of materials together using needle and thread. In this unit, pupils will need to use sewing skills to make a soft toy, therefore they will learn how to use stuffing to pad out two pieces of fabric. They will also need to consider how their toy looks as well as being robust enough for a toddler to play with.

Skills Development Task

Concepts

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

NC - Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately

NC - 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

NC - Investigate and analyse a range of existing products

- Design and make an animal soft toy, aimed at toddlers, in association with the Scottish Wildlife Trust

PICTURE OUR PLANET - Food Technology

Pupils will learn about the history of the traditional Scottish sweet, Tablet. They will need to follow the recipe provided and then experiment with different flavours to make it individual to them. They will take feedback on their creations, and this could then be expanded to selling their flavoured table at a later date.

Concepts

NC - understand and apply the principles of a healthy and varied diet

- To make the traditional Scottish sweet, tablet

Design Technology

Knowledge Progression Term 5 & Term 6

Adventurers 1 / Year 3	Adventurers 2 / Year 4
Three Giant Steps (Term 5)  No Design Technology in this Project	**Window on the World (Term 5)**  No Design Technology in this Project
Saxon King (Term 5) No Design Technology in this Project	**Viking Warrior (Term 5)** No Design Technology in this Project
COME FLY WITH ME! AFRICA - Food Technology (Term 6) This unit focuses on food technology. Pupils will expand their understanding of where food comes from by recognising that a lot of food products come from African countries, and they will look at Fairtrade as an organisation that ensures farmers and growers get a fair price for their produce. Pupils will learn how to prepare and make a range of African inspired dishes. They will need to consider hygiene and safety when using heat sources and also think about how their food is presented from a design technology perspective. **Concepts** • **Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately (NC)** • **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 (NC)** • **Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques (NC)** • **Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed (NC)** • To learn some basic cooking skills **Design Technology - Cooking and Nutrition** **Core 1 Unit 3 Lesson 1: A Balanced Diet – Plant or Animal (within Come Fly with Me! Africa)** • Know what constitutes a healthy diet (including understanding calories and other nutritional content) • Know where different foods come from **Core 1 Unit 3 Lesson 2: A Balanced Diet – Balancing Act (within Come Fly with Me! Africa)** • Know what constitutes a healthy diet (including understanding calories and other nutritional content) • Know about and understand the function of different food groups for a balanced diet **Core 1 Unit 3 Lesson 3: Working With Food – Master Chef** **Concepts** • Know the principles of planning and preparing a range of healthy meals **Core 1 Unit 3 Lesson 4: Working With Food – Our Food Hall** **Concepts** • Learn to prepare and cook a variety of dishes	**Cry Freedom (Term 6)** No Design Technology in this Project

Design Technology

Key Vocabulary Term 1 & Term 2					
Adventurers 1 / Year 3		**Adventurers 2 / Year 4**			
That's All, Folks! (Term 1)		**Lightening Speed (Term 1)**			
paper fastener	scissor mechanism	profile	evaluate	communication	
link	model	detail	user	device	
rotate	puppet	needs	product	invention	
slide		needs analysis	purpose	gadgets	
operate		research	use	robots	
pivot point		design	Evil Genius		
Lindow Man (Term 2)		**Out and About (Term 2)**			
No Design Technology in this Project		No Design Technology in this Project			
Rocky the Findosaur (Term 2)		**May the Force Be With You (Term 2)**			
No Design Technology in this Project		No Design Technology in this Project			

Design Technology

Key Vocabulary Term 3 & Term 4					
Adventurers 1 / Year 3			**Adventurers 2 / Year 4**		
Athens vs Sparta – Structures (Term 3)			**Law and Order - Levers and Linkages (Term 3)**		
design	MDF (medium	bench hook	paper fastener	scissor mechanism	
model	density fibreboard)	dowel	link	model	
siege weapon	washer	plan view	rotate	puppet	
trebuchet	screw		slide		
construct	saw		operate		
timber	clamp/peg		pivot point		
Under The Canopy (Term 4)			**Picture Our Planet – Textiles & Food Technology (Term 4)**		
profile	evaluate	traditional methods	soft toy	materials	condensed milk
detail	user	natural materials	template	wool	caster sugar
needs	product		outline / pattern	toddlers' toy	vanilla extract
needs analysis	purpose		pin		spread
research	use		sew		whisk
design	Tribal Child		stuffing		flavour

Design Technology

Key Vocabulary Term 5 & Term 6			
Adventurers 1 / Year 3			**Adventurers 2 / Year 4**
Three Giant Steps (Term 5)			**Window on the World (Term 5)**
No Design Technology in this Project			No Design Technology in this Project
Saxon King (Term 5)			**Viking Warrior (Term 5)**
No Design Technology in this Project			No Design Technology in this Project
Come Fly With Me! Africa (Term 6)			**Cry Freedom (Term 6)**
seeds	preparation	dice	blend	No Design Technology in this Project
grow	method	slice	food hygiene	
produce	servings	simmer		
seasonality	grams	boil		
season (salt & pepper)	ounces	griddle		
	tbsp / tsp	fry		
ingredient	mix	bake		

Design Technology

NAVIGATORS

Knowledge Building					
Food Technology	**Users and Purposes**	**Product Research**	**Design Technology Vocabulary**	**Product Features**	**Invention and Development**
Know how to use a range of techniques such as peeling, slicing, grating, kneading and spreading	Know what impact products have beyond their intended purpose	Know how to gather information about the needs and wants of groups and individuals	Know the correct technical vocabulary for the projects they are undertaking	Understand the relationship between a product's features and its functionality and usability	Know and understand the importance of patent, copyright and trademark in the design process

Design Technology Skills Progression – Navigators Year 5&6

Dt35 Investigate ways of meeting design challenges with a construction focus
Dt36 Investigate how the work of individuals in design and technology has helped to shape the world
Dt37 Identify users' views and take these into account
Dt38 Analyse a range of existing products
Dt39 Estimate and measure using appropriate instruments and units
Dt40 Plan what they have to do, including how to use materials, equipment and processes
Dt41 Communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design
Dt42 Apply knowledge of mechanical and electrical control when designing and making functional products
Dt43 Refine sequences of instructions to control events or make things happen
Dt44 Explore alternative ways of making their product, if first attempts fail
Dt45 Check work as it develops and modify as necessary
Dt46 Evaluate their products, identifying strengths and areas or development, and make appropriate changes
Dt47 Draw on and use various sources of information, including ICT sources
Dt48 Generate and clarify ideas for products, considering intended purpose
Dt49 Plan what they have to do, suggesting a sequence of actions and alternatives if needed
Dt50 Choose how to communicate design ideas as they develop, considering use and purpose
Dt51 Select from a wide range of tools and equipment to perform practical tasks accurately

Design Technology

Knowledge Progression Term 1 & Term 2

Navigators 1 / Year 5

Mission Control (Term 1)

Pupils will be using The Extraordinaires Spaceman project in this unit. Pupils will have extensive experience of the processes involved in researching, designing, making and evaluating for a range of products for a variety of users. In this unit, pupils are required to consider the needs of a real-life Extraordinaire. They will need to think about the impact their product has beyond its intended purpose; how will work with the rest of the Spaceman's equipment and in his limited workspace? Pupils will also need to address the relationship between the product's features and its functionality.

Concepts

NC - Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed a particular individuals or groups

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

NC - Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately

NC - 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

NC - Investigate and analyse a range of existing products

NC - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

- Design and make a model of a time-keeping device suitable for a spaceman

Navigators 2 / Year 6

A World Of Bright Ideas (Term 1)

Pupils will be introduced to new vocabulary and understand how important patent, trademark and copyright are in the invention and development of products. They will compare brand names and logos; recognising that a memorable logo is a great way of encouraging people to remember a brand or product.

Concepts

NC- Understand how key events and individuals in design and technology have helped shape the world

- To understand the meaning of the term 'copyright' and learn about why it is important
- To know about and understand what a patent is
- To know about and understand what a trademark is
- To design a new brand for a range of greetings cards

A World Of Bright Ideas – Mechanisms (Term 1)

Pupils will now use their advanced knowledge of frames and structures to build a 'racer' vehicle with a strong, stable structure and a motor powered by a simple electrical circuit. Pupils will be required to consider not only their design but also the materials, tools and techniques they will use in order to complete their project.

Skills Development Task

Concepts

NC - select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately

NC - Understand and use mechanical systems in their products (for example, gears, pulleys cams, levers and linkages)

NC - Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors

Design, make and evaluate a three wheeled 'racer'

Design Technology - Cooking and Nutrition

Core 1 Unit 2 Lesson 1: Food Choices – Secret Eaters

Concepts

- Know what constitutes a healthy diet (including understanding calories and other nutritional content)
- Know about the different food groups and their related importance as a part of a balanced diet
- Develop an awareness of their own dietary needs

Core 1 Unit 2 Lesson 2: Food Choices – Invention Team (within A World of Bright Ideas)

Know the principles of planning and preparing a range of healthy meals

Core 1 Unit 2 Lesson 3: Cooking – Michelin Stars (within A World of Bright Ideas)

- Know what constitutes a healthy diet (including understanding calories and other nutritional content)
- Know how to cook and apply the principles of nutrition and healthy eating
- Prepare and cook with a variety of ingredients, using a range of cooking techniques

Design Technology

The Rescuers (Term 2) No Design Technology in this Project **Go With The Flow (Term 2)** No Design Technology in this Project	**True Crime? (Term 2)** No Design Technology in this Project **Time Team (Term 2)** No Design Technology in this Project

Design Technology

Knowledge Progression Term 3 & Term 4

Navigators 1 / Year 5

You're Not Invited (Term 3)

Pupils will be using The Extraordinaires Soldier project in this unit. Pupils will have extensive experience of the processes involved in researching, designing, making and evaluating for a range of products for a variety of users. In this unit, pupils are required to consider the needs of a real-life Extraordinaire. They will need to think about the impact their product has beyond its intended purpose; how will work with the rest of the Soldier's equipment? Pupils will also need to address the relationship between the product's features and its functionality.

Concepts

NC - Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed a particular individuals or groups

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

NC - Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately

NC - 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

NC - Investigate and analyse a range of existing products

NC - Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

- Design and make a sleeping place suitable for a soldier

Full of Beans - Electronics 2 (Term 4)

Through science, pupils have experimented with designing, making and testing a range of electrical circuits with different components. Now, they will implement this knowledge and these skills to produce a circuit that has a clear purpose. Pupils will need to consider the features of their circuit and how it relates to its functionality. They will also address that their design has impact in other ways.

Skills Development Task

Concepts

NC - Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors

NC - Apply their understanding of computing to program, monitor and control their products

- Design, make and evaluate a traffic control system

Navigators 2 / Year 6

Wars of the World - Electronics 1 (Term 3)

Through science, pupils have experimented with designing, making and testing a range of electrical circuits with different components. Now, they will implement this knowledge and these skills to produce a circuit that has a clear purpose. Pupils will need to consider the features of their circuit and how it relates to its functionality. They will also address that their design has impact in other ways.

Skills Development Task

Concepts

NC - Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors

NC - Apply their understanding of computing to program, monitor and control their products

- Design, make and evaluate a device to send Morse Code signals

Global Warning - Board Game Product Design (Term 4)

Pupils will design and make a board game based on learning about pollution and waste. They will evaluate existing games before designing and making a prototype of their game in small 'business groups'. Once complete, they will present and demonstrate their game.

Concepts

NC - 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

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

NC - 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

NC - Investigate and analyse a range of existing products

- To design and make a prototype board game on pollution and waste using existing board games as research

Design Technology

Knowledge Progression Term 5 & Term 6	
Navigators 1 / Year 5	**Navigators 2 / Year 6**
Been Around the World (Term 5) No Design Technology in this Project	**In Your Element (Term 5)** No Design Technology in this Project
British Bulldog (Term 5) No Design Technology in this Project	**Pharaoh Queen (Term 5)** No Design Technology in this Project
Come Fly With Me! America - Mechanisms - Structures 1 (Term 6) Previously, pupils have learnt how specific mechanisms play a role in constructing strong and useful structures. In this unit, pupils will work through several processes to initially build a strong frame and then join these frames together to form a bridge. Pupils will be required to consider not only their design but also the materials, tools and techniques they will use in order to complete their project. **Skills Development Task** **Concepts** **NC -** Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately **NC -** Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Create a frame structure • Join up frames to create a bridge	**"I Have a Dream…" – Textiles (Term 6)** Pupils will draw on the knowledge and skills learn in previous pathways to create a useable and aesthetically pleasing textile product. They will use sewing skills to join more than one piece of fabric together using more complex stitches, as well as have potential opportunity to use a sewing machine. They will need to stuff and secure their cushion so that it is comfortable for someone to use. **Skills Development Task** **Concepts** **NC -** Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **NC -** 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 • Make a cushion following a pattern

Design Technology

Key Vocabulary Term 1 & Term 2					
Navigators 1 / Year 5			**Navigators 2 / Year 6**		
Mission Control (Term 1)			**A World of Bright Ideas – Mechanisms – Structures 2 (Term 1)**		
profile	evaluate	safety	copyright	brand name	ingredient
detail	user	backup plan	symbol	logo	teamwork
needs	product	time-keeping device	patent	pitch	food invention
needs analysis	purpose	watch	rights	panel	menu
research	use	clock	permissions	collaboration	success criteria
design	Spaceman	limited space	trademark	end product	review
					score
The Rescuers (Term 2)			**True Crime? (Term 2)**		
No Design Technology in this Project			No Design Technology in this Project		
Go With the Flow (Term 2)			**Time Team (Term 2)**		
No Design Technology in this Project			No Design Technology in this Project		

Design Technology

Key Vocabulary Term 3 & Term 4					
Navigators 1 / Year 5				**Navigators 2 / Year 6**	
You're Not Invited (Term 3)				**Wars of the World – Electronics 1 (Term 3)**	
profile	evaluate	specialised	comfort	Samuel Morse	circuit diagram
detail	user	equipment	practicality	Morse Code	series
needs	product	adaptation		dots and dashes	parallel
needs analysis	purpose	camp		circuit	brighter
research	use	bed		signals	sequence
design	Soldier	hammock		1.5v lamp	
Full of Beans – Food Tech – Electronics 2 (Term 4)				**Global Warning – Board Game Design (Term 4)**	
Samuel Morse	circuit diagram			research	counters
Morse Code	series			design	tokens
dots and dashes	parallel			prototype	dice
circuit	brighter			evaluation criteria	board
signals	sequence			planning board	
1.5v lamp				ideas	

Design Technology

Key Vocabulary Term 5 & Term 6					
Navigators 1 / Year 5			**Navigators 2 / Year 6**		
Been Around the World (Term 5)			**In Your Element (Term 5)**		
No Design Technology in this Project			No Design Technology in this Project		
British Bulldog (Term 5)			**Pharaoh Queen (Term 5)**		
No Design Technology in this Project			No Design Technology in this Project		
Come Fly With Me! America - Mechanisms – Structures 1 (Term 6)			**"I Have A Dream…" – Textiles (Term 6)**		
structure	pulley	3v motor	outline	sew	stuffing
frame	axle	wire cutter	pattern	stitch	
strengthen	components	dowel	pattern pieces	blanket stitch	
frame structures	aerodynamic	multi-core wire	recycled fabrics	running stitch	
bridge	lightweight	connectors	millimetres	back stitch	
weight	rubber washer		pin	backing piece	

Design Technology

Composites and Components – Skills and Knowledge

Year 3	Term 4 – Under the Canopy		
	Composites & Components		**Components**
	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 (NC) **Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design (NC)** **Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately (NC)** **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 (NC)** **Investigate and analyse a range of existing products (NC)** **Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work (NC)**	To generate, develop and explain ideas for products to meet a range of needs	To know that a need, in terms of design technology, is something that motivates a customer to buy a product To be able to discuss, share and sketch several ideas for a product To be able to take a few different ideas and consider ways to combine their best features
		To identify a purpose and establish criteria for a successful product	To be able to use existing products to identify the features that make them successful To be able to identify some features of their design that have specific purposes or uses e.g. soft fabric for a cuddly toy
		To evaluate work, adapting and improving where appropriate	To be able to show clear changes to a design without losing their original ideas To be able to give reasons for changes and make annotations on their design
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes	To know that an annotated sketch or design is one that has brief explanations attached to the drawing, to help to define and describe specific aspects To know that annotations are ways of showing comments and notes and that they can be revised and changed during the design process To know that a cross-sectional design allows the viewer to see a 3D model in a 2D view To know that a prototype is a simple model that allows an idea to be initially tested To be able to add some simple annotations to their designs before and after making a prototype To be able to draw their designs from more than one perspective e.g. side elevations as well as from the front To be able to construct a prototype that shows clear references to their 2D designs To be able to share their ideas with adults and peers clearly
		To select appropriate tools and techniques, name and describe them	To be able to name a range of tools such as craft knife, saw, sandpaper, cutting board To be able to name techniques used when making in design technology such as cut, trim, sand and smooth To be able to select and say why they have chosen certain tools and techniques
		To measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with some accuracy	To be able to use a ruler with a level of accuracy To be able to use other measurement tools, such as a compass to draw curved lines To be able to use scissors independently to cut fabrics and softer materials To be able to use sharper blades, such as craft knives, with some supervision To be able to use a range of glues to join materials together
		To use research to inform their design	To be able to use research skills developed in ICT/computing to gather appropriate and informative ideas To be able to use the ideas of others to inform their designs and not simply copy them To be able to say why they cannot copy the ideas of others (plagiarism) To be able to say where they got their ideas from

		To evaluate work, adapting and improving through the views of others to improve their work	To be able to listen to criticism without taking it personally To be able to take a good idea suggested to them by someone else and incorporate it into their own design
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes	To know that annotations can be revised and changed during the design process To be able to add some simple annotations to their designs before and after making a prototype To be able to draw their designs from more than one perspective e.g. side elevations as well as from the front To be able to construct a prototype that shows clear references to their 2D designs To be able to share their ideas with adults and peers clearly
		To select from and use a range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	To know that functionality relates to how well a product works and the functions it possesses To know that aesthetics refers to how the product affects the senses such as how it looks, tastes, feels etc. To be able to recognise the need for aspects of both when designing To be able to say why they have chosen a particular component, material or ingredient based on functionality or aesthetics
		To join and combine materials and components accurately in temporary and permanent ways	To be able to say why a temporary join is sometimes necessary e.g. to hold another part of the structure whilst its paint dries or another join stiffens To be able to select materials that work well for temporary joins, such as wire ties or Sellotape To be able to select tools that allow for permanent joins, such as making simple joints or using strong glues
		To measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with increasing accuracy	To be able to use a ruler with a good level of accuracy To be able to use other measurement tools, such as a compass to draw curved lines with increasing accuracy To be able to use scissors independently to cut fabrics and softer materials To be able to use sharper blades such as craft knives with some supervision and with increasing accuracy

Design Technology

Year 3	Term 6 – Come Fly With Me! Africa		
	Composites & Components		**Components**
	Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately (NC) **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 (NC)** **Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques (NC)** **Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed (NC)**	To generate, develop and explain ideas for products to meet a range of needs	To know that a need, in terms of design technology, is something that motivates a customer to buy a product To be able to discuss, share and sketch several ideas for a product To be able to take a few different ideas and consider ways to combine their best features
		To explore ways of meeting design challenges with a food focus using a range of cooking techniques	To be able to explain who they are preparing food for To be able to recognise that some people have food preferences that affect their whole diet (allergies, intolerances, vegetarian, vegan etc) and that this will inform a food design plan To be able to discuss the different ways food can be cooked
		To identify a purpose and establish criteria for a successful product	To be able to use existing products to identify the features that make them successful To be able to identify some features of their design that have specific purposes or uses e.g. soft fabric for a cuddly toy
		To evaluate work, adapting and improving where appropriate	To be able to show clear changes to a design without losing their original ideas To be able to give reasons for changes and make annotations on their design

Design Technology

	Term 1 – Lightning Speed		
Year 4	**Composites & Components**		**Components**
	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 (NC) **Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design (NC)** **Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) accurately (NC)** **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** **nvestigate and analyse a range of existing products (NC)** **Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work (NC)**	To generate, develop and explain ideas for products to meet a range of needs	To know that a need, in terms of design technology, is something that motivates a customer to buy a product To be able to discuss, share and sketch several ideas for a product To be able to take a few different ideas and consider ways to combine their best features
		To identify a purpose and establish criteria for a successful product	To be able to use existing products to identify the features that make them successful To be able to identify some features of their design that have specific purposes or uses e.g. soft fabric for a cuddly toy
		To evaluate work, adapting and improving where appropriate	To be able to show clear changes to a design without losing their original ideas To be able to give reasons for changes and make annotations on their design
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes	To know that an annotated sketch or design is one that has brief explanations attached to the drawing, to help to define and describe specific aspects To know that annotations are ways of showing comments and notes and that they can be revised and changed during the design process To know that a cross-sectional design allows the viewer to see a 3D model in a 2D view To know that a prototype is a simple model that allows an idea to be initially tested To be able to add some simple annotations to their designs before and after making a prototype To be able to draw their designs from more than one perspective e.g. side elevations as well as from the front To be able to construct a prototype that shows clear references to their 2D designs To be able to share their ideas with adults and peers clearly
		To select appropriate tools and techniques, name and describe them	To be able to name a range of tools such as craft knife, saw, sandpaper, cutting board To be able to name techniques used when making in design technology such as cut, trim, sand and smooth To be able to select and say why they have chosen certain tools and techniques
		To measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with some accuracy	To be able to use a ruler with a level of accuracy To be able to use other measurement tools, such as a compass to draw curved lines To be able to use scissors independently to cut fabrics and softer materials To be able to use sharper blades, such as craft knives, with some supervision To be able to use a range of glues to join materials together
		To use research to inform their design	To be able to use research skills developed in ICT/computing to gather appropriate and informative ideas To be able to use the ideas of others to inform their designs and not simply copy them To be able to say why they cannot copy the ideas of others (plagiarism) To be able to say where they got their ideas from
		To evaluate work, adapting and improving through the views of others to improve their work	To be able to listen to criticism without taking it personally To be able to take a good idea suggested to them by someone else and incorporate it into their own design

		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes	To know that annotations can be revised and changed during the design process To be able to add some simple annotations to their designs before and after making a prototype To be able to draw their designs from more than one perspective e.g. side elevations as well as from the front To be able to construct a prototype that shows clear references to their 2D designs To be able to share their ideas with adults and peers clearly
		To select from and use a range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	To know that functionality relates to how well a product works and the functions it possesses To know that aesthetics refers to how the product affects the senses such as how it looks, tastes, feels etc. To be able to recognise the need for aspects of both when designing To be able to say why they have chosen a particular component, material or ingredient based on functionality or aesthetics
		To join and combine materials and components accurately in temporary and permanent ways	To be able to say why a temporary join is sometimes necessary e.g. to hold another part of the structure whilst its paint dries or another join stiffens To be able to select materials that work well for temporary joins, such as wire ties or Sellotape To be able to select tools that allow for permanent joins, such as making simple joints or using strong glues
		To measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with increasing accuracy	To be able to use a ruler with a good level of accuracy To be able to use other measurement tools, such as a compass to draw curved lines with increasing accuracy To be able to use scissors independently to cut fabrics and softer materials To be able to use sharper blades such as craft knives with some supervision and with increasing accuracy

Design Technology

Year 5	Term 1 – Mission Control		
	Composites & Components		**Components**
	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed a particular individuals or groups (NC) **Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design (NC)** **Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately (NC)** **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 (NC)** **Investigate and analyse a range of existing products (NC)** **Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work (NC)**	To investigate ways of meeting design challenges with a construction focus	To be able to name, and select from, a range of materials that are most appropriate for construction purposes To be able to choose from a range of techniques for joining pieces together e.g. glue, pins, small nails or simple joints To be able to use strengthening features, such as triangles added to corners or diagonal pieces being added to increase strength and rigidity
		To investigate how the work of individuals in design and technology has helped to shape the world	To be able to name some well-known designers and architects and some of the things and places they have designed To be able to recognise where others have been influenced by the work of designers
		To identify users' views and take these into account	To be able to find reviews of products on websites and recognise that not all reviews are genuine To be able to listen to feedback from others regarding their own products and consider how positive changes could be made
		To analyse a range of existing products	To be able to research products that have similar features to one they are designing To be able to consider and prioritise the design features of an existing product To be able to ask questions such as 'Why has the designer chosen that shape?' 'What does this one do that others don't? To be able to make notes, annotations and sketches of existing products and use them as a guide when designing their own products
		To estimate and measure using appropriate instruments and units	To be able to use appropriate measures when starting construction e.g. mm when measuring small items to m when measuring larger ones To be able to consistently use one form of measurement to avoid building problems To be able to use estimating skills before measuring and cutting To be able to use rulers and tape measures when measuring
		To plan what they have to do, including how to use materials, equipment and processes	To be able to adopt planning skills, from subjects such as science, when setting up a design plan To be able to set clear steps, and time frames when beginning a plan To be able to make note of when some adult support may be needed
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	To know that an exploded diagram is a diagram that shows how a product can be assembled and how the separate parts fit together To know that pattern pieces are used in textiles to provide a guide to sewing a garment to the desired size To be able to draw their designs from more than one perspective To be able to draw parts or sections of their design to show a particular piece in more detail To be able to construct a prototype that shows clear references to their 2D designs To be able to make small sections of their design (a mock-up) to decide if their design needs changes or edits To be able to use CAD programs to show 3D as well as 2D design ideas
		To apply knowledge of mechanical and electrical control when designing and making functional products	To be able to demonstrate how to make a simple circuit To be able to discuss ways in which circuits or moving mechanisms can be integrated into products To be able to work with a team to make mechanical or electrical systems fit within a circuit

		To explore alternative ways of making their product, if first attempts fail	To be able to identify a problem and revisit drawings or sketches to make modifications, before making changes to the product To be able to consider different materials or techniques when making alternative models e.g. an original material was not strong enough to support all the required parts
		To check work as it develops and modify as necessary	To be able to stop during the various phases of a project to check whether what they have done is satisfactory and can help them progress to the next stage To know to seek help and advice if they are unsure of the next steps
		To evaluate their products, identifying strengths and areas for development, and make appropriate changes	To be able to recognise the strengths of their work and what has worked particularly well To be able to say what hasn't worked as well and consider some appropriate changes To be able to show clear changes to a design without abandoning their original ideas To be able to give reasons for changes and make annotations to their design
		To draw on and use various sources of information, including ICT sources	To be able to use ICT/computing skills in writing algorithms and using design-based programs within their design technology projects To be able to search the internet effectively to find sources that will support their projects e.g. images or instructional texts for design ideas
		To generate and clarify ideas for products, considering intended purpose	To be able to make clear from the start what the purpose of their design and product is To be able to revisit this purpose throughout the design process to ensure that this is still the focus
		To plan what they have to do, suggesting a sequence of actions and alternatives if needed	To be able to set clear sequenced steps, and time frames, and be aware of processes when beginning to plan To be able to show a clear sequence of actions in the form of a time frame, method or sequence diagram To be able to make note of when some adult support may be needed To be able to make note of where potential problems may arise and show suggest possible alternatives within their plan
		To choose how to communicate design ideas as they develop, considering use and purpose	To be able to think of ways to share ideas, such as group discussions, presentations or sharing drawings, sketches or models To be able to share their design process with adults or peers through informal conversations To be able to identify a part of their design that explicitly shows the use and purpose of their final product
		To select from a wide range of tools and equipment to perform practical tasks accurately	To be able to listen and adhere to safety instructions when using more dangerous tools To be able to select tools that are most efficient for the job To be able to use their selected tools with care and accuracy, especially when cutting, to ensure the pieces are neat and accurately cut. To be able to accurately use rulers, compasses, protractors and set squares for measuring materials

Design Technology

Year 5	Term 3 – You're Not Invited		
	Composites & Components		**Components**
	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed a particular individuals or groups (NC) **Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design (NC)** **Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately (NC)** **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 (NC)** **Investigate and analyse a range of existing products (NC)** **Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work (NC)**	To investigate ways of meeting design challenges with a construction focus	To be able to name, and select from, a range of materials that are most appropriate for construction purposes To be able to choose from a range of techniques for joining pieces together e.g. glue, pins, small nails or simple joints To be able to use strengthening features, such as triangles added to corners or diagonal pieces being added to increase strength and rigidity
		To analyse a range of existing products	To be able to research products that have similar features to one they are designing To be able to consider and prioritise the design features of an existing product To be able to ask questions such as 'Why has the designer chosen that shape?' 'What does this one do that others don't? To be able to make notes, annotations and sketches of existing products and use them as a guide when designing their own products
		To plan what they have to do, including how to use materials, equipment and processes	To be able to adopt planning skills, from subjects such as science, when setting up a design plan To be able to set clear steps, and time frames when beginning a plan To be able to make note of when some adult support may be needed
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	To know that an exploded diagram is a diagram that shows how a product can be assembled and how the separate parts fit together To know that pattern pieces are used in textiles to provide a guide to sewing a garment to the desired size To be able to draw their designs from more than one perspective To be able to draw parts or sections of their design to show a particular piece in more detail To be able to construct a prototype that shows clear references to their 2D designs To be able to make small sections of their design (a mock-up) to decide if their design needs changes or edits To be able to use CAD programs to show 3D as well as 2D design ideas
		To explore alternative ways of making their product, if first attempts fail	To be able to identify a problem and revisit drawings or sketches to make modifications, before making changes to the product To be able to consider different materials or techniques when making alternative models e.g. an original material was not strong enough to support all the required parts
		To check work as it develops and modify as necessary	To be able to stop during the various phases of a project to check whether what they have done is satisfactory and can help them progress to the next stage To know to seek help and advice if they are unsure of the next steps
		To evaluate their products, identifying strengths and areas for development, and make appropriate changes	To be able to recognise the strengths of their work and what has worked particularly well To be able to say what hasn't worked as well and consider some appropriate changes To be able to show clear changes to a design without abandoning their original ideas To be able to give reasons for changes and make annotations to their design
		To draw on and use various sources of information, including ICT sources	To be able to use ICT/computing skills in writing algorithms and using design-based programs within their design technology projects To be able to search the internet effectively to find sources that will support their projects e.g. images or instructional texts for design ideas
		To generate and clarify ideas for products, considering intended purpose	To be able to make clear from the start what the purpose of their design and product is To be able to revisit this purpose throughout the design process to ensure that this is still the focus
		To plan what they have to do, suggesting a sequence of actions and alternatives if needed	To be able to set clear sequenced steps, and time frames, and be aware of processes when beginning to plan To be able to show a clear sequence of actions in the form of a time frame, method or sequence diagram To be able to make note of when some adult support may be needed To be able to make note of where potential problems may arise and show suggest possible alternatives within their plan

		To choose how to communicate design ideas as they develop, considering use and purpose	To be able to think of ways to share ideas, such as group discussions, presentations or sharing drawings, sketches or models To be able to share their design process with adults or peers through informal conversations To be able to identify a part of their design that explicitly shows the use and purpose of their final product
		To select from a wide range of tools and equipment to perform practical tasks accurately	To be able to listen and adhere to safety instructions when using more dangerous tools To be able to select tools that are most efficient for the job To be able to use their selected tools with care and accuracy, especially when cutting, to ensure the pieces are neat and accurately cut. To be able to accurately use rulers, compasses, protractors and set squares for measuring materials

Design Technology

Year 5	Term 6 – Come Fly With Me! - America		
	Composites & Components		**Components**
	Select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately (NC) **Apply their understanding of how to strengthen, stiffen and reinforce more complex structures (NC)**	To plan what they have to do, including how to use materials, equipment and processes	To be able to adopt planning skills, from subjects such as science, when setting up a design plan To be able to set clear steps, and time frames when beginning a plan To be able to make note of when some adult support may be needed
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	To know that an exploded diagram is a diagram that shows how a product can be assembled and how the separate parts fit together To know that pattern pieces are used in textiles to provide a guide to sewing a garment to the desired size To be able to draw their designs from more than one perspective To be able to draw parts or sections of their design to show a particular piece in more detail To be able to construct a prototype that shows clear references to their 2D designs To be able to make small sections of their design (a mock-up) to decide if their design needs changes or edits To be able to use CAD programs to show 3D as well as 2D design ideas
		To evaluate their products, identifying strengths and areas for development, and make appropriate changes	To be able to recognise the strengths of their work and what has worked particularly well To be able to say what hasn't worked as well and consider some appropriate changes To be able to show clear changes to a design without abandoning their original ideas To be able to give reasons for changes and make annotations to their design
		To plan what they have to do, suggesting a sequence of actions and alternatives if needed	To be able to set clear sequenced steps, and time frames, and be aware of processes when beginning to plan To be able to show a clear sequence of actions in the form of a time frame, method or sequence diagram To be able to make note of when some adult support may be needed To be able to make note of where potential problems may arise and show suggest possible alternatives within their plan
		To choose how to communicate design ideas as they develop, considering use and purpose	To be able to think of ways to share ideas, such as group discussions, presentations or sharing drawings, sketches or models To be able to share their design process with adults or peers through informal conversations To be able to identify a part of their design that explicitly shows the use and purpose of their final product
		To select from a wide range of tools and equipment to perform practical tasks accurately	To be able to listen and adhere to safety instructions when using more dangerous tools To be able to select tools that are most efficient for the job To be able to use their selected tools with care and accuracy, especially when cutting, to ensure the pieces are neat and accurately cut. To be able to accurately use rulers, compasses, protractors and set squares for measuring materials

Design Technology

	Term 1 – A World of Bright Ideas		
	Composites & Components		**Components**
Year 6	**Understand how key events and individuals in design and technology have helped shape the world (NC)** **select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately (NC)** **Understand and use mechanical systems in their products (for example, gears, pulleys cams, levers and linkages) (NC)** **Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors (NC)**	To investigate how the work of individuals in design and technology has helped to shape the world	To be able to name some well-known designers and architects and some of the things and places they have designed To be able to recognise where others have been influenced by the work of designers
		To identify users' views and take these into account	To be able to find reviews of products on websites and recognise that not all reviews are genuine To be able to listen to feedback from others regarding their own products and consider how positive changes could be made
		To analyse a range of existing products	To be able to research products that have similar features to one they are designing To be able to consider and prioritise the design features of an existing product To be able to ask questions such as 'Why has the designer chosen that shape?' 'What does this one do that others don't? To be able to make notes, annotations and sketches of existing products and use them as a guide when designing their own products
		To estimate and measure using appropriate instruments and units	To be able to use appropriate measures when starting construction e.g. mm when measuring small items to m when measuring larger ones To be able to consistently use one form of measurement to avoid building problems To be able to use estimating skills before measuring and cutting To be able to use rulers and tape measures when measuring
		To plan what they have to do, including how to use materials, equipment and processes	To be able to adopt planning skills, from subjects such as science, when setting up a design plan To be able to set clear steps, and time frames when beginning a plan To be able to make note of when some adult support may be needed
		To communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	To know that an exploded diagram is a diagram that shows how a product can be assembled and how the separate parts fit together To know that pattern pieces are used in textiles to provide a guide to sewing a garment to the desired size To be able to draw their designs from more than one perspective To be able to draw parts or sections of their design to show a particular piece in more detail To be able to construct a prototype that shows clear references to their 2D designs To be able to make small sections of their design (a mock-up) to decide if their design needs changes or edits To be able to use CAD programs to show 3D as well as 2D design ideas
		To draw on and use various sources of information, including ICT sources	To be able to use ICT/computing skills in writing algorithms and using design-based programs within their design technology projects To be able to search the internet effectively to find sources that will support their projects e.g. images or instructional texts for design ideas
		To generate and clarify ideas for products, considering intended purpose	To be able to make clear from the start what the purpose of their design and product is To be able to revisit this purpose throughout the design process to ensure that this is still the focus
		To plan what they have to do, suggesting a sequence of actions and alternatives if needed	To be able to set clear sequenced steps, and time frames, and be aware of processes when beginning to plan To be able to show a clear sequence of actions in the form of a time frame, method or sequence diagram To be able to make note of when some adult support may be needed To be able to make note of where potential problems may arise and show suggest possible alternatives within their plan
		To choose how to communicate design ideas as they develop, considering use and purpose	To be able to think of ways to share ideas, such as group discussions, presentations or sharing drawings, sketches or models To be able to share their design process with adults or peers through informal conversations To be able to identify a part of their design that explicitly shows the use and purpose of their final product

Design Technology

Design Technology Skills	Year 3								Year 4								
	That's All Folks	Lindow Man	Rocky the Findosaur	Athens Vs Sparta	Under the Canopy	Three Giant Steps	Saxon King	Come Fly With Me	Lightening Speed	Out and About	May The Force Be With You	Law and Order	Picture our Planet	Window on the World	Viking Warrior	Cry Freedom	seasons around the world
Dt21 Generate, develop and explain ideas for products to meet a range of needs					■			■	■								
Dt22 Explore ways of meeting design challenge with a food focus using a range of cooking techniques								■					■				
Dt23 Identify a purpose and establish criteria for a successful product					■			■	■						■		
Dt24 Evaluate work, adapting and improving where appropriate					■				■								
Dt25 Communicate, design ideas in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes					■				■						■		
Dt26 Selecting appropriate tools and techniques, name and describe them					■				■				■				
Dt27 Measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with some accuracy					■				■				■		■		
D28 Use research to inform their design					■				■								
Dt29 Explore ways of meeting design challenges with a textile focus															■		
D30 Evaluate work, adapting and improving through the views of others to improve their work					■			■	■								
Dt31 Communicate design ideas, in different ways e.g. discussion, annotated sketches, cross-sectional diagrams and prototypes					■				■								
Dt32 Select from and use a range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities					■				■				■		■		
Dt33 Join and combine materials and components accurately in temporary and permanent ways					■				■								
Dt34 Measure, mark, cut out and shape a range of materials and assemble, join and combine components and materials with increasing accuracy					■				■						■		

Design Technology

Design Technology Skills	Year 5								Year 6							
	Mission Control	The Rescuers	Go with the Flow	You're not Invited	Full of Beans	Been around the world	British Bulldog	Come Fly With Me	A World of Bright Ideas	True Crime?	Time Team	Wars of the World	Global Warning	In Your Element	Pharaoh Queen	I Have a Dream...
Dt35 Investigate ways of meeting design challenges with a construction focus	■			■												
Dt36 Investigate how the work of individuals in design and technology has helped to shape the world	■								■							
Dt37 Identify users' views and take these into account	■								■							
Dt38 Analyse a range of existing products	■			■					■							
Dt39 Estimate and measure using appropriate instruments and units	■								■							
Dt40 Plan what they have to do, including how to use materials, equipment and processes	■			■				■	■							
Dt41 Communicate design ideas in different ways e.g. discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer aided design	■			■				■	■							
Dt42 Apply knowledge of mechanical and electrical control when designing and making functional products	■				■				■							
Dt43 Refine sequences of instructions to control events or make things happen																
Dt44 Explore alternative ways of making their product, if first attempts fail	■			■												
Dt45 Check work as it develops and modify as necessary	■			■												
Dt46 Evaluate their products, identifying strengths and areas or development, and make appropriate changes	■			■				■								
Dt47 Draw on and use various sources of information, including ICT sources	■			■					■							

Design Technology

Dt48 Generate and clarify ideas for products, considering intended purpose																	
Dt49 Plan what they have to do, suggesting a sequence of actions and alternatives if needed																	
Dt50 Choose how to communicate design ideas as they develop, considering use and purpose																	
Dt51 Select from a wide range of tools and equipment to perform practical tasks accurately																	