

Design Technology Progression



Design Technology in the National Curriculum

The National Curriculum for Design 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.

In Key Stage 1, 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.

In Key Stage 2, pupils should be taught to:

Design:

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.

Make:

- Select from and use a wider range of tools and equipment to perform practical tasks - for example, cutting, shaping, joining and finishing – accurately.
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.

Evaluate:

- Investigate and analyse a range of existing products.
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work,
- Understand how key events and individuals in design and technology have helped shape the world.

Technical Knowledge:

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- Understand and use mechanical systems in their products - for example, gears, pulleys, cams, levers and linkages.
- Understand and use electrical systems in their products - for example, series circuits incorporating switches, bulbs, buzzers and motors.
- Apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition:

- Understand and apply the principles of a healthy and varied diet.
- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.
- Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.

Design Technology at Ark Bentworth

At Ark Bentworth we recognise that 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 and wants. They acquire a broad range of subject specific knowledge and draw upon 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 of the creativity, culture, wealth and well-being of the nation.

- **Year 1:** Books with Moving Parts, Vehicles, Fruit Kebabs
- **Year 2:** Crowns, Textile Puppets, Plant Pots
- **Year 3:** Bridges, Making Pizza, Greenhouses
- **Year 4:** Moving Pictures, Pencil Cases, Skyscrapers
- **Year 5:** Shields, Baking Bread, Moving Toys
- **Year 6:** Bird Boxes, Utility Belts, Fairground Rides

The units are organised so that pupils undertake a design and technology project three times each year. These projects provide pupils with experiences, knowledge and skills in cooking and nutrition, textiles, structures, mechanisms, materials, mechanical systems and electrical systems. Within each unit, pupils go through the same process of exploring existing products and developing their own knowledge and skills before designing, making and evaluating a product of their own. Where appropriate, to provide a holistic learning experience for our pupils, the design and technology curriculum makes links with history, science and geography. However, this will never be at the expense of design and technology as a subject in its own right

Unit Knowledge, Skills and Understanding

Year 1			
	Books with Moving Parts <i>Mechanisms</i>	Vehicles <i>Structures</i>	Fruit Kebabs <i>Cooking and Nutrition</i>
Prior Knowledge	<p>Across EYFS: Pupils were taught to work through the process of ‘plan, do, review’ when undertaking an activity of their choice. They were encouraged to draw a plan before undertaking a project and were asked to decide whether they would like their creation to be part of a gallery upon completion. Throughout their time in EYFS, pupils had access to tools such as paper, scissors, glue, junk modelling and construction toys e.g. wooden blocks and Lego.</p> <p>EYFS, Can you make it work? Pupils had access to a ‘tinkering table’ where they explored using a range of tools and mechanisms such as nuts and bolts. Pupils also explored pulleys and ropes.</p>	<p>Across EYFS: Pupils were taught to work through the process of ‘plan, do, review’ when undertaking an activity of their choice. They were encouraged to draw a plan before undertaking a project and were asked to decide whether they would like their creation to be part of a gallery upon completion. Throughout their time in EYFS, pupils had access to tools such as paper, scissors, glue, junk modelling and construction toys e.g. wooden blocks and Lego.</p> <p>EYFS, Can you make it work? Pupils made dens outside. They used a range of available resources. Pupils also made a vehicle with junk modelling materials.</p>	<p>Across EYFS: Pupils were taught to work through the process of ‘plan, do, review’ when undertaking an activity of their choice. They were encouraged to draw a plan before undertaking a project and were asked to decide whether they would like their creation to be part of a gallery upon completion. Throughout their time in EYFS, pupils had access to tools such as paper, scissors, glue, junk modelling and construction toys e.g. wooden blocks and Lego. Pupils were also taught the importance of washing their hands before eating and they talked about healthy choices for bodies at a simple level.</p> <p>EYFS, How do things change over time? Pupils experienced preparing food with the support and guidance of an adult e.g. they baked bread in response to reading The Little Red Hen.</p>
Designing	<p>Developing, planning and communicating ideas:</p> <p>Pupils can think of some ideas of their own.</p> <p>Pupils can explain what they want to do.</p> <p>Pupils can use pictures to plan.</p> <p>Pupils can use words and annotations to plan.</p>		
Making	<p>Working with tools, equipment, materials and components to make quality products:</p> <p>Pupils can explain what they are making.</p> <p>Pupils can select from a range of tools.</p> <p>Pupils can explain which tools they are using.</p>		
Evaluating	<p>Evaluating processes and products:</p> <p>Pupils can explore existing products.</p> <p>Pupils can describe how something works.</p> <p>Pupils can talk about their own completed work.</p> <p>Pupils can evaluate their own work against their plan.</p>		
Technical	<p>Mechanisms:</p> <p>Pupils can make a product which moves.</p> <p>Pupils can cut materials using scissors.</p> <p>Pupils can describe materials using different words.</p>	<p>Structures:</p> <p>Pupils can explain how they want to construct their product.</p>	<p>Cooking and Nutrition:</p> <p>Pupils can cut food safely.</p> <p>Pupils can describe the texture of foods.</p>

	<p>Pupils can explain why they have chosen moving parts.</p> <p>Pupils can join materials as part of a moving product.</p> <p>Pupils can add some kind of design to their product.</p>	<p>Pupils can select appropriate resources and tools for constructing their product.</p> <p>Pupils can make simple plans before making a model e.g. arranging pieces before construction begins.</p> <p>Pupils can incorporate movement into their model.</p>	<p>Pupils know to wash their hands and make sure surfaces are clean.</p> <p>Pupils can explain what it means to be hygienic.</p> <p>Pupils can think of interesting ways to present their food.</p>
Year 2			
	Crowns Structures	Puppets Textiles	Plant Pot Holders Structures
Prior Knowledge	<p>Year 1, Structures (Vehicles): Pupils worked through the process of design, make, evaluate to create their own vehicles. Pupils explained how they wanted to construct their product, selected appropriate resources and tools for constructing their product and made simple plans before making their model e.g. arranging pieces before construction begins.</p>	<p>Across EYFS: Pupils had access to different fabrics during role-play and used them to imagine different characters. They also used threading toys to enhance their fine motor skills.</p>	<p>Year 1, Structures (Vehicles): Pupils worked through the process of design, make, evaluate to create their own vehicles. Pupils explained how they wanted to construct their product, selected appropriate resources and tools for constructing their product and made simple plans before making their model e.g. arranging pieces before construction begins.</p> <p>Year 2, Structures (Crowns): Pupils worked through the process of design, make, evaluate to create their own crowns. Pupils made sensible choices as to which materials to use for their structures, developed their own ideas from an initial stimulus and considered how to make their models appealing to others. Pupils also measured materials to use in their constructions and joined materials together in different ways.</p>
Design	<p>Developing, planning and communicating ideas:</p> <p>Pupils can design purposeful, functional, and appealing products for themselves based on design criteria.</p> <p>Pupils can think of their own ideas and plan what to do next.</p> <p>Pupils can describe their design by using pictures, diagrams, models and annotations.</p>		
Make	<p>Working with tools, equipment, materials and components to make quality products:</p> <p>Pupils can join things together in different ways.</p> <p>Pupils can choose the best tools for a specific purpose.</p> <p>Pupils can choose the best materials for a specific purpose.</p> <p>Pupils can use tools and equipment with care and safety.</p>		
Evaluate	<p>Evaluating processes and products:</p> <p>Pupils can evaluate existing products.</p> <p>Pupils can evaluate their work against the initial design criteria.</p> <p>Pupils can explain what went well with their work.</p> <p>Pupils can explain what they would improve if they completed the process again.</p>		

Technical Knowledge	<p>Structures:</p> <p>Pupils can make sensible choices as to which materials to use for their structures.</p> <p>Pupils can develop their ideas from an initial stimulus.</p> <p>Pupils can consider how to make their models appealing to others.</p> <p>Pupils can measure materials to use in their constructions.</p> <p>Pupils can join materials together in different ways.</p>	<p>Textiles:</p> <p>Pupils can measure textiles.</p> <p>Pupils can cut textiles.</p> <p>Pupils can join textiles together to make something.</p> <p>Pupils can explain why they chose a certain textile.</p> <p>Pupils can add embellishment to their textile product.</p>	<p>Structures:</p> <p>Pupils can develop ideas from an initial stimulus.</p> <p>Pupils can consider how to make their models appealing to others.</p> <p>Pupils can measure materials to use in their structures.</p> <p>Pupils can construct the same product using different materials before comparing them.</p> <p>Pupils can make their structures stronger.</p>
	Year 3		
	Bridges Structures	Pizza Cooking and Nutrition	Greenhouses Structures
Prior Knowledge	<p>Year 2, Structures (Crowns): Pupils worked through the process of design, make, evaluate to create their own crowns. Pupils made sensible choices as to which materials to use for their structures, developed their own ideas from an initial stimulus and considered how to make their models appealing to others. Pupils also measured materials to use in their constructions and joined materials together in different ways.</p> <p>Year 2, Structures (Plant Pot Holders): Pupils worked through the process of design, make, evaluate to create their own plant pot holders. Pupils developed their own ideas from an initial stimulus and considered how to make their models appealing to others. Pupils also measured materials to use in their structures, constructed the same product using different materials before comparing them and explored ways to make their structures stronger.</p>	<p>Year 1, Cooking and Nutrition (Fruit Kebabs): Pupils worked through the process of design, make, evaluate to create their own fruit kebabs. Pupils cut food safely and described the texture of foods. They learnt how to wash their hands and make sure surfaces are clean and explored what it means to be hygienic. Pupils also thought of interesting ways to present their food.</p>	<p>Year 2, Structures (Plant Pot Holders): Pupils worked through the process of design, make, evaluate to create their own plant pot holders. Pupils developed their own ideas from an initial stimulus and considered how to make their models appealing to others. Pupils also measured materials to use in their structures, constructed the same product using different materials before comparing them and explored ways to make their structures stronger.</p> <p>Year 3, Structures (Bridges): Pupils worked through the process of design, make, evaluate to create their own bridges. Pupils explored and reviewed a range of bridges in the locality and discovered how key individuals have helped shape the world of construction. Pupils explored which materials are most suitable for creating structures and joined materials effectively. They also applied their understanding of how to strengthen, stiffen and reinforce more complex structures and explored the impact of adding shapes within structures.</p>
	<p>Developing, planning and communicating ideas:</p> <p>Pupils can show that their design meets a range of requirements.</p> <p>Pupils can put together a step-by-step plan which shows the process they will follow.</p> <p>Pupils can outline the equipment and tools they will need as part of the planning process.</p> <p>Pupils can describe their design using words, an accurately labelled sketch and prototypes.</p> <p>Pupils create designs which are realistic and which they are able to follow.</p>		
Design			

Make	<p>Working with tools, equipment, materials and components to make quality products: Pupils can select from and use a wider range of tools and equipment to perform practical tasks. Select from a wide range of materials and components according to their functional properties and aesthetic qualities. Pupils can use equipment and tools accurately.</p>		
Evaluate	<p>Evaluating processes and products: Pupils can use research to inform the design of a product which meets a design brief. Pupils can investigate and analyse a range of existing real-life products. Pupils can evaluate their ideas and products against their own design criteria and consider the views of others to improve their work Pupils can explain what they changed which made their product even better.</p>		
Technical Knowledge	<p>Structures: Pupils can explore and review a range of real-life structures (bridges) in the locality. Pupils understand how key individuals (i.e., the bridge architects) have helped shape the world of construction. Pupils know which materials are most suitable for creating structures. Pupils can join materials effectively. Pupils understand the impact of adding shapes to structures. Pupils can apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p>	<p>Cooking and Nutrition: Pupils understand and apply the principles of a healthy and varied diet. Pupils can prepare and cook a savoury dish. Pupils know where and how some ingredients are grown. Pupils are beginning to understand the idea of seasonality and what we mean by airmiles. Pupils can choose the right ingredients for a product. Pupils can make their food product look attractive. Pupils know what to do to be hygienic and safe when preparing food products. Pupils can describe how their combined ingredients came together into a final product.</p>	<p>Structures: Pupils understand how key events and individuals in design and technology have helped shape the world. Pupils know which materials are most suitable for creating shell structures. Pupils can explain the pros and cons of choosing certain materials for a structure. Pupils can join materials effectively. Pupils understand the impact of adding shapes to structures. Pupils can apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Pupils can produce a structure that will be used for a real-life purpose. Pupils can use finishing techniques to ensure their structure is aesthetically pleasing.</p>
Year 4			
	Moving Pictures Mechanisms	Pencil Cases Textiles	Skyscrapers Structures and Electronics
Prior Knowledge	<p>Year 1, Mechanisms (Books with Moving Parts): Pupils worked through the process of design, make, evaluate to create their own moving part for a book. They made a product which moves, cut materials using scissors and described materials using different words. Pupils also explained why they have chosen moving parts, joined materials as part of a moving product and added some kind of design to their product.</p>	<p>Year 2, Textiles (Puppets): Pupils worked through the process of design, make, evaluate to create their own puppets. They measured textiles, cut textiles and joined textiles together to make something. Pupils also explained why they chose a certain textile and added embellishment to their textile product.</p>	<p>Year 3, Structures (Bridges): Pupils worked through the process of design, make, evaluate to create their own bridges. Pupils explored and reviewed a range of bridges in the locality and discovered how key individuals have helped shape the world of construction. Pupils explored which materials are most suitable for creating structures and joined materials effectively. They also applied their understanding of how to strengthen, stiffen and reinforce more complex structures and explored the impact of adding shapes within structures.</p>

			<p>Year 3, Structures (Greenhouses): Pupils worked through the process of design, make, evaluate to create their own greenhouses. Pupils explored how key events and individuals in design and technology have helped shape the world. They discovered which materials are most suitable for creating shell structures and explained the pros and cons of choosing certain materials for a structure. Pupils also joined materials effectively, explored the impact of adding shapes to structures and applied their understanding of how to strengthen, stiffen and reinforce more complex structures. They produced a structure that would be used for a real-life purpose and used finishing techniques to create something aesthetically pleasing.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Design</p>	<p>Developing, planning and communicating ideas: Pupils can add their own ideas to the initial design criteria. Pupils can design purposeful, functional, and appealing products for themselves and others based on a design criteria. Pupils take into account the ideas of others when designing. Pupils can generate, develop, model and communicate their ideas through discussions and annotated sketches. Pupils can explain their tool and material choices within their plans. Pupils can create more than one design before choosing their favourite. Pupils can suggest some improvements for their own plan and implement them before the ‘make’ stage.</p>		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Make</p>	<p>Working with tools, equipment, materials and components to make quality products: Pupils can pause during the ‘make’ process and decide whether their finished product is going to be good quality. Pupils can show a good level of expertise when using a range of tools and equipment. Select from and use a wider range of tools and equipment to perform practical tasks Select from and use a wider range of materials and textiles according to their functional properties and aesthetic qualities. Pupils are able to continue working at their product even when their original ideas may not have worked.</p>		
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Evaluate</p>	<p>Evaluating processes and products: Pupils can use research as a way to gather ideas about existing products that are fit for purpose. Pupils can investigate and analyse a range of existing products. Pupils can evaluate their product against the design brief – taking into consideration both appearance and the way it works. Pupils can explain how they can improve their original design and why this improvement would be successful. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their product.</p>		

Technical Knowledge	<p>Mechanisms: Pupils understand the difference between a lever and a linkage. Pupils know how mechanical systems such as levers and linkages or pneumatic systems create movement. Pupils can accurately make cuts and holes. Pupils can measure carefully so as to make sure they have not made mistakes. Pupils can accurately join materials together in a way which still allows them to move. Pupils can identify the pivot point. Pupils have used finishing techniques which show an awareness of audience.</p>	<p>Textiles: Pupils can join textiles in different ways. Pupils can explain how textiles can be joined in different ways. Pupils can select textiles for both their appearance and their properties. Pupils think about what the user would want when they are selecting textiles. Pupils have thought about how to make their textile product strong and functional. Pupils are able to devise and use their own simple template.</p>	<p>Structures: Pupils can explore and review a range of real-life structures (skyscrapers) in and beyond the locality. Pupils can measure materials carefully and accurately. Pupils can apply their knowledge of adding shapes to structures to ensure they are strong. Pupils can create a structure which balances and is freestanding. Electronics: Pupils can add a simple working circuit to their product. Pupils can add a circuit which contains a switch and bulb. Pupils know how to check that the components in a circuit are working. Apply their understanding of computing to programme, monitor and control their products.</p>
	Year 5		
	Helmets and Shields Structures	Bread Food and Nutrition	Toys Mechanisms
Prior Knowledge	<p>Year 3, Structures (Greenhouses): Pupils worked through the process of design, make, evaluate to create their own greenhouses. Pupils explored how key events and individuals in design and technology have helped shape the world. They discovered which materials are most suitable for creating shell structures and explained the pros and cons of choosing certain materials for a structure. Pupils also joined materials effectively, explored the impact of adding shapes to structures and applied their understanding of how to strengthen, stiffen and reinforce more complex structures. They produced a structure that would be used for a real-life purpose and used finishing techniques to create something aesthetically pleasing.</p> <p>Year 4, Structures (Skyscrapers): Pupils worked through the process of design, make, evaluate to create their own skyscrapers. They explored and reviewed a range of skyscrapers within and beyond the locality. Pupils also measured the materials they were using carefully and accurately, applied their knowledge of adding shapes to structures to ensure they are strong and created a structure which balanced and was freestanding. They also added a working circuit to their structures.</p>	<p>Year 1, Cooking and Nutrition (Fruit Kebabs): Pupils worked through the process of design, make, evaluate to create their own fruit kebabs. Pupils cut food safely and described the texture of foods. They learnt how to wash their hands and make sure surfaces are clean and explored what it means to be hygienic. Pupils also thought of interesting ways to present their food.</p> <p>Year 3, Cooking and Nutrition (Pizza): Pupils worked through the process of design, make, evaluate to create their own pizzas. Pupils explored and applied the principles of a healthy and varied diet to prepare and cook a savoury dish. They discovered where and how some ingredients are grown, chose the right ingredients for their product and began to understand the idea of seasonality and what we mean by airmiles. Pupils described how their combined ingredients came together into a final product and explored how to make their final food product look attractive. Pupils also discussed what to do to be hygienic and safe when preparing food products.</p>	<p>Year 1, Mechanisms (Books with Moving Parts): Pupils worked through the process of design, make, evaluate to create their own moving part for a book. They made a product which moves, cut materials using scissors and described materials using different words. Pupils also explained why they have chosen moving parts, joined materials as part of a moving product and added some kind of design to their product.</p> <p>Year 4, Mechanisms (Moving Pictures): Pupils worked through the process of design, make, evaluate to create their own moving pictures. Pupils discovered the difference between a lever and a linkage and explored how mechanical systems such as levers and linkages or pneumatic systems create movement. Pupils accurately made cuts and holes and measured carefully so as to make sure they had not made mistakes. Pupils also accurately joined materials together in a way which still allowed them to move and identified the pivot point. They also used finishing techniques to show an awareness of audience.</p>

Design	<p>Developing, planning and communicating ideas:</p> <p>Pupils can generate their own design criteria/brief.</p> <p>Pupils can design purposeful, functional, and appealing products for themselves and others of their choosing based on a design criteria.</p> <p>Pupils can come up with a range of ideas and designs after collecting information about existing products.</p> <p>Pupils can take the user's view and the result of questionnaires into account when designing.</p> <p>Pupils can explain how their product will appeal to the target audience.</p> <p>Pupils can produce a detailed step-by-step plan which highlights areas where the 'make' process may be more difficult.</p> <p>Pupils can design using annotated sketches and cross-sectional planning.</p> <p>Pupils can design more than one product and explain the positives and drawbacks of each before choosing their final design.</p> <p>Pupils have thought of how they will check if their design is successful as they work.</p>		
Make	<p>Working with tools, equipment, materials and components to make quality products:</p> <p>Pupils can select from and use a wider range of tools and equipment to perform practical tasks accurately and expertly.</p> <p>Pupils can select from and use a wider range of materials and components according to their functional properties and aesthetic qualities.</p> <p>Pupils can pause at different stages throughout the 'make' process to decide and explain whether their product is going to be good quality.</p> <p>Pupils can adapt their plans if necessary, during the 'make' process – they can explain why these adaptations are necessary.</p> <p>Pupils persevere through the different stages of the making process.</p>		
Evaluate	<p>Evaluating processes and products:</p> <p>Pupils can use research as a way to gather ideas about existing products that are fit or not fit for purpose.</p> <p>Pupils can listen to and incorporate others' evaluations of existing products.</p> <p>Pupils continuously evaluate their own designs against the design brief.</p> <p>Pupils can effectively evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p> <p>Pupils can effectively evaluate the ideas of products of others against their design criteria and suggest how their work could be improved.</p> <p>Pupils can evaluate appearance and function against the original criteria.</p> <p>Pupils can explain which was the most difficult part of the process and why.</p>		
Technical Knowledge	<p>Structures:</p> <p>Pupils can make accurate measurements and ensure everything is precise.</p> <p>Pupils can design and make a structure which provides protection.</p> <p>Pupils can design and make a structure which can be worn by the user.</p> <p>Pupils can apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</p> <p>Pupils can ensure their product is strong, sturdy and fit for the intended purpose.</p>	<p>Cooking and Nutrition:</p> <p>Pupils can describe what they do to be both hygienic and safe when preparing food.</p> <p>Pupils know where a variety of bread types originate from.</p> <p>Pupils know where a variety of ingredients come from.</p> <p>Select from a wider range of ingredients according to their functional qualities.</p> <p>Pupils can explain how their ingredients have changed from the beginning of the 'make' process to their final product.</p> <p>Pupils can explain how their product should be stored.</p> <p>Pupils are able to present their final product in an interesting and appealing way.</p>	<p>Mechanisms:</p> <p>Pupils understand what a mechanical object is.</p> <p>Pupils can describe how mechanical objects are part of our daily lives.</p> <p>Pupils can explain how different shaped cams change the movement of the follower.</p> <p>Pupils can explain how gears transmit movement.</p> <p>Pupils can design and make a product using gears/cams.</p> <p>Pupils can make accurate measurements and ensure everything is precise.</p> <p>Pupils can ensure their product is strong, sturdy and fit for the intended purpose.</p> <p>Pupils can refine their mechanical product after testing it.</p>

Year 6

	Bird Boxes Structures	Belts Textiles	Fairground Rides Structures and Electronics
Prior Knowledge	<p>Year 4, Structures (Skyscrapers): Pupils worked through the process of design, make, evaluate to create their own skyscrapers. They explored and reviewed a range of skyscrapers within and beyond the locality. Pupils also measured the materials they were using carefully and accurately, applied their knowledge of adding shapes to structures to ensure they are strong and created a structure which balanced and was freestanding. They also added a working circuit to their structures.</p> <p>Year 5, Structures (Helmets and Shields): Pupils worked through the process of design, make, evaluate to create their own helmets and shields. Pupils made accurate measurements to ensure everything was precise, designed and made a structure to provide protection and be worn by the user. Pupils also applied their understanding of how to strengthen, stiffen and reinforce more complex structures and ensured their product was strong, sturdy and fit for the intended purpose.</p>	<p>Year 2, Textiles (Puppets): Pupils worked through the process of design, make, evaluate to create their own puppets. They measured textiles, cut textiles and joined textiles together to make something. Pupils also explained why they chose a certain textile and added embellishment to their textile product.</p> <p>Year 4, Textiles (Pencil Cases): Pupils worked through the process of design, make, evaluate to create their own pencil cases. They devised and used their own simple template, joined textiles in different ways and were able to explain the different joins. They selected textiles for both their appearance and their properties but also thought about what the user would want. Pupils also thought about how to make their textile product strong and functional.</p>	<p>Year 4, Structures and Electronics (Skyscrapers): Pupils worked through the process of design, make, evaluate to create their own skyscrapers. They explored and reviewed a range of skyscrapers within and beyond the locality. Pupils also measured the materials they were using carefully and accurately, applied their knowledge of adding shapes to structures to ensure they are strong and created a structure which balanced and was freestanding. They also added a working circuit to their structures which contained a switch and bulb, checked that the components in the circuit were working and applied their understanding of computing to programme, monitor and control their products.</p> <p>Year 6, Structures (Bird Boxes): Pupils worked through the process of design, make, evaluate to create their own bird boxes. They selected from and use a wider range of materials and components including wood and tools and justified why they had selected specific materials. Pupils ensured that their work was precise and accurate, hid joints so as to improve the look of their product and used their knowledge of structures to reinforce and strengthen a 3D framework.</p>
Design	<p>Developing, planning and communicating ideas:</p> <ul style="list-style-type: none"> Pupils can use a range of information to inform their design. Pupils can use market research to inform their design. Pupils can develop and idea whilst also working within constraints such as time, resources and costs. Pupils can produce suitable lists of tools, equipment, materials needed, considering constraints. Pupils can select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics. Pupils can make design decisions, considering, resources and cost. Pupils can follow and refine their plan if necessary. Pupils can justify their plan to someone else. Pupils can use annotated sketches, cross sectional planning and exploded diagrams. Pupils can model and refine design ideas by making prototypes and using pattern pieces and through using computer-aided designs. 		

Make	<p>Working with tools, equipment, materials and components to make quality products:</p> <p>Pupils can use selected tools and equipment precisely and expertly.</p> <p>Pupils can accurately measure, mark out, cut and shape materials and components.</p> <p>Pupils can accurately assemble, join and combine materials and components.</p> <p>Pupils can accurately apply a range of finishing techniques.</p> <p>Pupils can use techniques that involve a number of steps.</p> <p>Pupils can be resourceful with practical problems.</p> <p>Pupils can change the way they are working if needed.</p> <p>Pupils know to independently check their product will be the best it can be throughout the ‘make’ process.</p>		
	<p>Evaluating processes and products:</p> <p>Pupils can carry out thorough evaluations of existing products considering: how well they have been made, the materials, whether they work, how they’ve been made, fit for purpose.</p> <p>Pupils can evaluate how much products cost to make and how innovative they are</p> <p>Pupils can research and discuss how sustainable materials are.</p> <p>Pupils can independently evaluate whether or not their product and the products of others meet all design criteria.</p> <p>Pupils can test and evaluate their final product; explain what would improve it and consider the effect different resources may have had.</p> <p>Pupils can explain whether different resources have improved their product.</p> <p>Pupils can consider whether they need more or different information to make their product even better.</p> <p>Pupils can consider the impact of products beyond their intended purpose.</p>		
Technical Knowledge	<p>Structures:</p> <p>Pupils can they justify why they selected specific materials.</p> <p>Pupils can select from and use a wider range of materials and components including wood and tools.</p> <p>Pupils can ensure that their work is precise and accurate.</p> <p>Pupils can they hide joints so as to improve the look of their product.</p> <p>Pupils can use their knowledge of structures to reinforce and strengthen a 3D framework.</p>	<p>Textiles:</p> <p>Pupils can think what the user would want when choosing textiles to use.</p> <p>Pupils can make a textiles product attractive, strong and functional.</p> <p>Pupils know that a 3D textiles product can be made from a combination of fabric shapes.</p> <p>Pupils can measure and cut multiple pieces of textiles accurately.</p> <p>Pupils can make up a prototype first.</p> <p>Pupils can join multiple pieces of textiles using a range of joining techniques.</p> <p>Pupils can create a textiles product which can be worn.</p> <p>Pupils can consider how their product could be sold.</p>	<p>Structures:</p> <p>Pupils can ensure that their work is precise and accurate.</p> <p>Pupils can they hide joints so as to improve the look of their product.</p> <p>Pupils can use their knowledge of structures to reinforce and strengthen a 3D framework.</p> <p>Pupils can justify their design in relation to the audience.</p> <p>Electronics:</p> <p>Pupils know how more complex electrical circuits and components can be used to create functional products.</p> <p>Pupils can incorporate a switch and motor into their product.</p> <p>Pupils can refine their electronic product after testing it.</p> <p>Pupils can incorporate hydraulics and pneumatics.</p> <p>Pupils can use different kinds of circuit in their product.</p>