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| Design & Technology | **Pedagogical Knowledge****How do children learn in design and technology?** Children learn best when challenged in a series of well-designed tasks linked to meaningful contexts.Children learn best when given the opportunity to talk and discuss how to design, plan, shape and handle materials, evaluate their work and that of others.Whilst most work in D.T is practical, there is an abstract element to the subject, in that children speculate about ways they might develop artefacts and systems.Children should have hands-on experience of designing and making and visualising possibilities and reflecting with others.Much of the teachers is to frame meaningful contexts and challenges that require learners to think, do and engage with the manmade world.Teacher instruction, modelling and explanation all have a place, but particular use should be made of artefacts, visual resources and materials.Task design process is important. Children need to be clear about the task’s objectives.**Design process steps in D.T Investigate, Create, Evaluate**1. Identify a need
2. Design
3. Plan
4. Make
5. Evaluate
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| Y1&2Cycle B | **Autumn****Movers & Shakers** | **Spring****Coastline** | **Summer****Magnificent Monarchs** |
| Unit | Remarkable Recipes | Beach Hut | Cut, Stitch and Join | Push and Pull |
| Local Heritage | Hartburn Co-op | RNLI – Redcar Lifeboat Station | Elizabeth’s Embroidery | Card Factory |
| Y1 | Planning and making a new school meal**Food comes from two main sources: animals and plants.****Milk comes mainly from cows but also from goats and sheep.****Eggs belong to the animal product category.****They are laid by female animals. The most common types eaten by humans include chicken and duck eggs.****Honey is made by bees.****Most edible oils are made from plant parts.****Olive oil, vegetable oil and coconut oil are all made from plant sources.****Sugar is made from plants called sugar cane and sugar beet.****Plants also give us nuts, such as almonds, walnuts and hazelnuts.**Describe why a product is important.Work hygienically by washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple healthy meal.Prepare ingredients by peeling, grating, chopping and slicing.Evaluate their ideas and products and explain how closely their finished products meet against a simple design criteria. Say what they could do better in the future. | Designing and making a beach hut.**Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares. A broader base will also make a structure more stable.****Properties of components and materials determine how they can and cannot be used. For example, plastic is shiny and strong but it can be difficult to paint.****Different tools have characteristics that make them suitable for specific purposes. For example, scissors are used for cutting paper because they have sharp, metal blades that can cut through thin materials.****Tools for working with wood include a junior hacksaw, for cutting; a bench hook, for supporting the wood and as a guide to cut; and a G clamp, for holding the bench hook and wood securely.**Describe why a product is important.Work safely in construction activities.Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effect.Build structures, exploring how they can be made stronger, stiffer and more stable.Evaluate their ideas and products and explain how closely their finished products meet against a simple design criteria. Say what they could do better in the future. | Designing and making a bag tag**There are many fabric home products. These include bedding, tea towels, cushions, tea cosies, toiletry bags and other containers**.**A brand is a name, term, design, or symbol identifying a seller's products or services.****A sewing pattern is a template of the parts needed to make a garment or product. Pattern pieces are usually made from paper**.**A running stitch is a basic stitch used to join two pieces of fabric.****Embellishment is a decorative detail or feature added to something to make it more attractive.**Describe why a product is important.Work safely in textile and sewing activities.Create a design to meet simple design criteriaSelect from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effectUse different methods of joining fabrics, including glue and running stitch.Add simple decorative embellishments, such as buttons, prints, sequins and appliqué.. | Designing and making a moving greetings card**People build machines to make their work easier.****A machine is made up of different parts that all work together to perform a task.****Individual parts of a machine are called components.****The part of a machine that brings about movement is called the mechanism.*** **A slider mechanism moves in a straight line.**
* **A lever mechanism is a bar that moves around a fixed point called a pivot.**
* **A linkage mechanism combines levers and sliders.**

Describe why a product is important.Work safely in construction activities.Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effectUse a range of mechanisms (levers, sliders, wheels and axles) in models or products.Make models with moving parts. |
| Y1Cumulative skill | * Select the appropriate tool or piece of equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) and explain their choice.
* Design purposeful, functional, appealing products for themselves and other users based on design criteria.
* Generate and communicate about their own and each other's ideas and work through a range of different methods including written work, drawing, diagrams, modelling, speaking, and using technology.
* Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
* Explain why a designer or inventor is important. Many key individuals have helped to shape the world. These include engineers, scientists, designers, inventors and many other people in important roles.
* To develop their own ideas through selecting and using materials and working on processes that interest them.
* To use initiative and resourcefulness in finding support when they need help or information.
* To articulate the plans they have made to carry out activities and what they might change if they were to repeat them.
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|   Y2 | Planning and making a new school meal**Food comes from two main sources: animals and plants.****Milk comes mainly from cows but also from goats and sheep.****Eggs belong to the animal product category.****They are laid by female animals. The most common types eaten by humans include chicken and duck eggs.****Honey is made by bees.****Most edible oils are made from plant parts.****Olive oil, vegetable oil and coconut oil are all made from plant sources.****Sugar is made from plants called sugar cane and sugar beet.****Plants also give us nuts, such as almonds, walnuts and hazelnuts.**Describe why a product is important.Work hygienically by washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple healthy meal.Create a design to meet simple design criteriaSelect from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effect.Prepare ingredients by peeling, grating, chopping and slicing.Evaluate their ideas and products and explain how closely their finished products meet against a simple design criteria. Say what they could do better in the future. | Designing and making a beach hut.**Structures can be made stronger, stiffer and more stable by using cardboard rather than paper and triangular shapes rather than squares. A broader base will also make a structure more stable.****Properties of components and materials determine how they can and cannot be used. For example, plastic is shiny and strong but it can be difficult to paint.****Different tools have characteristics that make them suitable for specific purposes. For example, scissors are used for cutting paper because they have sharp, metal blades that can cut through thin materials.****Tools for working with wood include a junior hacksaw, for cutting; a bench hook, for supporting the wood and as a guide to cut; and a G clamp, for holding the bench hook and wood securely.**Describe why a product is important.Work safely in construction activities.Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effect.Build structures, exploring how they can be made stronger, stiffer and more stable.Evaluate their ideas and products and explain how closely their finished products meet against a simple design criteria. Say what they could do better in the future. | Designing and making a bag tag**There are many fabric home products. These include bedding, tea towels, cushions, tea cosies, toiletry bags and other containers**.**A brand is a name, term, design, or symbol identifying a seller's products or services.****A sewing pattern is a template of the parts needed to make a garment or product. Pattern pieces are usually made from paper**.**A running stitch is a basic stitch used to join two pieces of fabric.****Embellishment is a decorative detail or feature added to something to make it more attractive.**Describe why a product is important.Work safely in textile and sewing activities.Create a design to meet simple design criteriaSelect from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Suggest ways of manipulating them to achieve the desired effectUse different methods of joining fabrics, including glue and running stitch.Add simple decorative embellishments, such as buttons, prints, sequins and appliqué.. | Designing and making a moving greetings card**People build machines to make their work easier.****A machine is made up of different parts that all work together to perform a task.****Individual parts of a machine are called components.****The part of a machine that brings about movement is called the mechanism.*** **A slider mechanism moves in a straight line.**
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| Y2Cumulative skill | * Select the appropriate tool or piece of equipment to perform practical tasks (for example, cutting, shaping, joining and finishing) and explain their choice.
* Design purposeful, functional, appealing products for themselves and other users based on design criteria.
* Generate and communicate about their own and each other's ideas and work through a range of different methods including written work, drawing, diagrams, modelling, speaking, and using technology.
* Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
* Explain why a designer or inventor is important. Many key individuals have helped to shape the world. These include engineers, scientists, designers, inventors and many other people in important roles.
* To design and develop their own ideas through selecting and using the most appropriate tools and materials.
* To show initiative and independence in finding support when they need help or information.
* To present the plans they have made to carry out activities and what evaluates the strengths and weaknesses of their design
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| Y3&4Cycle B | **Autumn****Invasion** | **Spring****Misty Mountain, Winding River** | **Summer****Ancient Civilisation** |
| Unit | Fresh Food, Good Food | Functional and Fancy Fabrics | Tomb Builders |
| Local Heritage | Hartburn Co-Op | Elizabeth’s Embroidery | Machine Mart |
| Y3 | Designing and making a healthy packaged snack**Significant scientists such as Louis Pasteur and inventors such as Nicolas Appert have ensured decay can be prevented or delayed by preservation methods, such as drying, salting, pickling, canning, pasteurising, refrigerating or freezing the food.****Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way.****A prototype is a mock-up of a design that will look like the finished product but may not be full size or made of the same materials.****Cooking techniques include baking, boiling, frying, grilling and roasting**Plan which materials will be needed for a task and explain why.Identify the main food groups (carbohydrates, protein, dairy, fruits and vegetables, fats and sugars).Use appliances safely with adult supervision. | Designing and making a William Morris inspired fabric.**William Morris was a British textile designer, artist and socialist activist associated with the British Arts and Crafts Movement.****William Morris was a significant contributor to the revival of traditional British textile arts and methods of production.****William Morris’ motifs consisted mainly of leaves, flowers, fruits and birds****A motif is a recurring shape in a design or pattern. Motifs can be figurative, vegetal, abstract or geometric. Islamic art features geometric motifs, which are made from regular shapes.**Develop design criteria to inform a design.Use tools safely for cutting and joining materials and components. | Design a machine prototype**There are six simple machines: pulley, lever, wheel and axle, wedge, inclined plane and screw.****Simple machines can be combined to make complex, compound machines. For example, a wheelbarrow combines a lever with a wheel and axle.****Characteristics of materials, such as rigidity, strength and smoothness will affect the success of a working model.****Evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made.**Explore and use a range of mechanisms (levers, sliders, axles, wheels and cams) in models or products. |
| Y3Cumulative skill | Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account.Can the child amend their product as they go to improve its outcome?* Can children demonstrate a creative response to the problem?
* Can children stick rigidly to the brief and consider the end user’s needs and preferences throughout the process
* Can the child think deeply and critically about other products and also about their own product?
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| Y4 | Designing and making a healthy packaged snack**Significant scientists such as Louis Pasteur and inventors such as Nicolas Appert have ensured decay can be prevented or delayed by preservation methods, such as drying, salting, pickling, canning, pasteurising, refrigerating or freezing the food.****Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way.****A prototype is a mock-up of a design that will look like the finished product but may not be full size or made of the same materials.****Cooking techniques include baking, boiling, frying, grilling and roasting.**Choose from a range of materials, showing an understanding of their different characteristics.Design a healthy snack or packed lunch and explain why it is healthy.Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. | Designing and making a William Morris inspired fabric.**William Morris was a British textile designer, artist and socialist activist associated with the British Arts and Crafts Movement.****William Morris was a significant contributor to the revival of traditional British textile arts and methods of production.****William Morris’ motifs consisted mainly of leaves, flowers, fruits and birds****A motif is a recurring shape in a design or pattern. Motifs can be figurative, vegetal, abstract or geometric. Islamic art features geometric motifs, which are made from regular shapes.**Use annotated sketches and exploded diagrams to test and communicate their ideas.Select, name and use tools with adult supervision. | Design a machine prototype**There are six simple machines: pulley, lever, wheel and axle, wedge, inclined plane and screw.****Simple machines can be combined to make complex, compound machines. For example, a wheelbarrow combines a lever with a wheel and axle.****Characteristics of materials, such as rigidity, strength and smoothness will affect the success of a working model.****Evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made.**Explore and use a range of mechanisms (levers, axles, cams, gears and pulleys) in models or products. |
| Y4Cumulative skill | Identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements.* Can child offer creative response to the problem and think deeply and critically about other products and about their own product?
* Can child follow a design brief and actively and accurately consider the end user’s needs and preferences throughout the process?
* Does the child display high quality presentation and precision in their design and make?
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| Y5&6Cycle B | **Autumn****Maafa** | **Spring****Frozen Kingdoms** | **Summer****Britain at War** |
| Unit | Food for Life | Engineer | Make Do and Mend |
| Local Heritage | Hasrtburn Co-Op | Transporter Bridge Visitor Centre | Elizabeth’s Embroidery |
| Y5 | Evaluate meals and consider if they contribute towards a balanced diet.Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. | Use pattern pieces and computer-aided design packages to design a product.Select and combine materials with precision. | Combine stitches and fabrics with imagination to create a mixed media collage.Use applique to add decoration to a product or artwork. |
| Y5Cumulative skill | Test and evaluate products against a detailed design specification and make adaptations as they develop the product.* Can they follow a well thought out design brief and have accurately researched the end user’s needs and preferences throughout the process?
* Can they evaluate critically other products and use this information to amend their own?
* Do they use a high quality and variety of presentation and precision in their design and make?
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| Y6 | Plan a healthy daily diet, justifying why each meal contributes towards a balanced diet.Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. | Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways.Choose the best materials for a task, showing an understanding of their working characteristics. | Pin and tack fabrics in preparation for sewing and more complex pattern work.Use different methods of fastening for function and decoration, including press studs, Velcro and buttons. |
| Y6Cumulative skill |  Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others.* Can they develop and follow a well thought out design brief and have accurately researched the end user’s needs and preferences throughout the process?
* Can they evaluate critically other products and use this information to make purposeful amendments their own?
* Do they use a high quality and variety of presentation and precision in their design and make?
* Can think deeply and critically about other products and identify the strengths and weaknesses of the designs?
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