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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 and Evaluate’**1. Identify a need
2. Design
3. Plan
4. Make
5. Evaluate
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| Y1&2Cycle A | **Autumn****Childhood** | **Spring****Bright Lights, Big City** | **Summer****School Days** |
| Unit | Shade and Shelter | Taxi | Chop, Slice & Mash |
| Local Heritage | Shelter Spotting Walk | Hartburn Garage Ltd | Hartburn Co-op |
| Y1 | Designing a den. **Different materials can be used for different purposes, depending on their properties.****A shelter is a structure designed to give protection from weather or danger. A shelter can be permanent, like a house or garage, or temporary, like a tent or gazebo.**Create a design to meet simple design criteria.Select and use a range of materials, beginning to explain their choices**.**Follow the rules to keep safe during a practical task.Construct simple structures, models or other products using a range of materials.Evaluate their ideas and products against a simple criteria and existing products.  | Designing a taxi**All products are designed for a specific purpose**.**A wheel is a circular object that is connected to an axle that makes vehicles and machines move. An axle is a rod that is connected to the centre of a wheel, which allows it to turn. A chassis is the frame of a vehicle.****Design criteria are the explicit goals that a project must achieve. Explore and use mechanisms, for example levers, sliders, wheels and axles in their products.** Create a design to meet simple design criteria.Select and use a range of materials, tools and components, beginning to explain their choices**.**Use wheels and axles to make a simple moving model.Evaluate their ideas and products against a simple criteria and existing products.  | Design and make a supermarket sandwich**Understand where food comes from. Some foods come from animals, such as meat, fish and dairy products. Other foods come from plants, such as fruit, vegetables, grains, beans and nuts.** **Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking.**Create a design to meet simple design criteria.Use the basic principles of a healthy and varied diet to prepare dishes.Describe why a product is important.Follow the rules to keep safe during a practical taskEvaluate their ideas and products against a simple criteria and existing products.  |
| Y1Cumulative skill | Design purposeful, functional and appealing products for themselves and others based on design criteria. Talk about their own and each other's work, identifying strengths or weaknesses and offering support. 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. |
| Y2 | Designing a den. **Different materials can be used for different purposes, depending on their properties.****A shelter is a structure designed to give protection from weather or danger. A shelter can be permanent, like a house or garage, or temporary, like a tent or gazebo.**Generate and communicate their ideas through a range of different methods.Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect.Work safely and hygienically in construction and cooking activities.Explore how a structure can be made stronger, stiffer and more stable.Evaluate their ideas and products against a simple criteria and existing products.  | Designing a taxi**All products are designed for a specific purpose**.**A wheel is a circular object that is connected to an axle that makes vehicles and machines move. An axle is a rod that is connected to the centre of a wheel, which allows it to turn. A chassis is the frame of a vehicle.****Design criteria are the explicit goals that a project must achieve. Explore and use mechanisms, for example levers, sliders, wheels and axles in their products.** Generate and communicate their ideas through a range of different methods.Select and use a range of materials, tools and components, beginning to explain their choices**.**Use a range of mechanisms (levers, sliders, wheels and axles) in models or products.Evaluate their ideas and products against a simple criteria and existing products.  | Design and make a supermarket sandwich**Understand where food comes from. Some foods come from animals, such as meat, fish and dairy products. Other foods come from plants, such as fruit, vegetables, grains, beans and nuts.** **Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking.**Use the basic principles of a healthy and varied diet to prepare dishes.Generate and communicate their ideas through a range of different methods.Work safely and hygienically in construction and cooking activities.Evaluate their ideas and products against a simple criteria and existing products.  |
| Y2Cumulative skill | Design purposeful, functional and appealing products for themselves and others based on design criteria. Talk about their own and each other's work, identifying strengths or weaknesses and offering support. Explain how closely their finished products meet their design criteria and say what they could do better in the future.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. |
| Y3&4Cycle A | **Autumn****Through The Ages** | **Spring****Rocks, Relics and Rumbles** | **Summer****Emperors and Empires** |
| Unit | Cook Well, Eatwell | Making it Move | Greenhouse |
| Local Heritage | Cornstar Tacos, Stockton  | Automaton Toys, Preston Park Museum | Hartburn School GreenhouseOxbridge Lane Allotments |
| Y3 | Planning and making a taco filling**There are five main food groups that should be eaten regularly as part of a balanced diet****Key inventions in design and technology have changed the way people live. The types of food that will grow in a particular area depend on a range of factors, such as the rainfall, climate and soil type. (seasonality) For example, many crops, such as potatoes and sugar beet, are grown in the south-east of England. Wheat, barley and vegetables grow well in the east of England.**Develop design criteria to inform a design.Identify and name foods that are produced in different places.Prepare and cook a simple savoury dish using a range of cooking techniques. Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  | Designing and making an Automaton toy**Particular products have been designed for specific tasks. Levers consist of a rigid bar that rotates around a fixed point, called a fulcrum. They reduce the amount of work needed to lift a heavy object. Sliders move from side to side or up and down, and are often used to make moving parts in books. Axles are shafts on which wheels can rotate to make a moving vehicle. Cams are devices that can convert circular motion into up-and-down motion.****Automata are machines that seem to move on their own and are intended to intrigue and delight an audience.**Develop design criteria to inform a design.Plan which materials will be needed for a task and explain why.Explore and use a range of mechanisms (levers, sliders, axles, wheels and cams) in models or products.Make working models with simple mechanisms or electrical circuits.Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  | Planning and making a mini Greenhouse**Design criteria are the exact goals a project must achieve to be successful. These criteria might include the product's use, appearance, cost and target user. Particular products have been designed for specific tasks.** **Explorations of the similarities and differences between pieces of art, structures and products from the same genre could focus on the subject matter, the techniques and materials used or the ideas and concepts that have been explored or developed.****Work from different designers can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market.**Compare artists, architects and designers and identify significant characteristics of the same style of artwork, structures and products through time.Develop design criteria to inform a design.Explain the similarities and difference between the works of two designers.Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  |
| Y3Cumulative skill | Select and use a wider range of equipment, tools, materials and components to perform practical tasks. Use tools safely. Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account.To demonstrate a creative response to the problem. To stick rigidly to the brief and consider the end user’s needs and preferences throughout the process.To think deeply and critically about other products and also about their own product. To amend their product as they go to improve its outcome. |
| Y4 | Planning and making a taco filling**There are five main food groups that should be eaten regularly as part of a balanced diet****Key inventions in design and technology have changed the way people live. The types of food that will grow in a particular area depend on a range of factors, such as the rainfall, climate and soil type. (seasonality) For example, many crops, such as potatoes and sugar beet, are grown in the south-east of England. Wheat, barley and vegetables grow well in the east of England.**Use annotated sketches and exploded diagrams to test and communicate their ideas.Identify and name foods that are produced in different places in the UK and beyond.Identify and use a range of cooking techniques to prepare a simple meal or snack.Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  | Designing and making an Automaton toy**Particular products have been designed for specific tasks. Levers consist of a rigid bar that rotates around a fixed point, called a fulcrum. They reduce the amount of work needed to lift a heavy object. Sliders move from side to side or up and down, and are often used to make moving parts in books. Axles are shafts on which wheels can rotate to make a moving vehicle. Cams are devices that can convert circular motion into up-and-down motion.****Automata are machines that seem to move on their own and are intended to intrigue and delight an audience.**Use annotated sketches and exploded diagrams to test and communicate their ideas.Choose from a range of materials, showing an understanding of their different characteristics.Select, name and use tools with adult supervision.Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  | Planning and making a mini Greenhouse**Design criteria are the exact goals a project must achieve to be successful. These criteria might include the product's use, appearance, cost and target user. Particular products have been designed for specific tasks.** **Explorations of the similarities and differences between pieces of art, structures and products from the same genre could focus on the subject matter, the techniques and materials used or the ideas and concepts that have been explored or developed.****Work from different designers can be compared by assessing specific criteria, such as their visual impact, fitness for purpose and target market.**Use annotated sketches and exploded diagrams to test and communicate their ideas.Select, name and use tools with adult supervision.Compare artists, architects and designers and identify significant characteristics of the same style of artwork, structures and products through time.Develop design criteria to inform a design.Explain the similarities and difference between the work of two designers.Evaluate their ideas and products against a simple criteria and existing products. Understand how key events and individuals in Design and Technology have helped to shape the world.  |
| Y4Cumulative skill | Select and use a wider range of equipment, tools, materials and components to perform practical tasks. Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. 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.To offer creative response to the problem and think deeply and critically about other products and also about their own product. To follow a design brief and actively and accurately consider the end user’s needs and preferences throughout the processTo display high quality presentation and precision in their design and make. |
| Y5&6Cycle A | **Autumn****Dynamic Dynasties** | **Spring****Sow Grow and Farm** | **Summer****Groundbreaking Greeks** |
| Unit | Moving Mechanisms | Eat the Seasons | Architecture |
| Local Heritage | Robinson’s Coliseum Fire 1899 | Stockton SOUP | Local Architectural Designers |
| Y5 | Designing and making a pneumatic prototype**Pneumatic systems use energy that is stored in compressed air to do work, such as inflating a balloon to open a model monster's mouth. These effects can be achieved using syringes and plastic tubing.****A focus group is a small group of people whose reactions and opinions about a product are taken and studied. Evaluations can be made by asking product users a selection of questions to obtain data on how the product has met its design criteria.**Explain the functionality and purpose of safety features on a range of products.Use mechanical systems in their products, such as pneumatics (gears, pulleys, cams, levers and linkages) Survey users in a range of focus groups and compare results.Test and evaluate products against a detailed design specification and make adaptations as they develop the product. | Design a make a seasonal soup**Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper.**Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. Evaluate meals and consider if they contribute towards a balanced diet. | Design an impressive, but functional building**Many new designs and inventions influenced society.** **Culture affects the design of some products.****Various methods can be used to support a framework. These include cross braces, guy ropes and diagonal struts. Frameworks can be built using lolly sticks, skewers and bamboo canes.**Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross sectional and exploded diagrams, prototypes, pattern pieces and computer aided designs. Build a framework using a range of materials to support mechanisms.Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Select and combine materials with precision.Test and evaluate products against a detailed design specification and make adaptations as they develop the product. |
| Y5 Cumulative skills | Use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and 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 designs. Select from and use a range of tools and equipment to perform practical tasks. Eg Cutting, shaping, joining and finishing accurately. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients according to their functional properties and aesthetic qualities. To follow a well thought out design brief and have accurately researched the end user’s needs and preferences throughout the process.To evaluate critically other products and use this information to amend their own.To use a high quality and variety of presentation and precision in their design and make. |
| Y6 | Designing and making a pneumatic prototype**Pneumatic systems use energy that is stored in compressed air to do work, such as inflating a balloon to open a model monster's mouth. These effects can be achieved using syringes and plastic tubing.****A focus group is a small group of people whose reactions and opinions about a product are taken and studied. Evaluations can be made by asking product users a selection of questions to obtain data on how the product has met its design criteria.**Demonstrate how their products take into account the safety of the user.Explain and use mechanical systems in their products to meet a design brief.Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others.Choose the best materials for a task, showing an understanding of their working characteristics.Create a detailed comparative report about two or more products or inventions.Test and evaluate products against a detailed design specification and make adaptations as they develop the product. | Design a make a seasonal soup**Seasonality is the time of year when the harvest or flavour of a type of food is at its best. Buying seasonal food is beneficial for many reasons: the food tastes better; it is fresher because it hasn't been transported thousands of miles; the nutritional value is higher; the carbon footprint is lower, due to reduced transport; it supports local growers and is usually cheaper.**Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. Plan a healthy daily diet, justifying why each meal contributes towards a balanced diet. | Design an impressive, but functional building**Many new designs and inventions influenced society.** **Culture affects the design of some products.****Various methods can be used to support a framework. These include cross braces, guy ropes and diagonal struts. Frameworks can be built using lolly sticks, skewers and bamboo canes.**Select the most appropriate materials and frameworks for different structures, explaining what makes them strong.Choose the best materials for a task, showing an understanding of their working characteristics. Demonstrate modifications made to a product as a result of ongoing evaluation by themselves and to others. |
| Y6 Cumulative skills | Use research and develop design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and 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 designs. Select from and use a range of tools and equipment to perform practical tasks. Eg Cutting, shaping, joining and finishing accurately. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients according to their functional properties and aesthetic qualities.To develop and follow a well thought out design brief and have accurately researched the end user’s needs and preferences throughout the process.To evaluate critically other products and use this information to make purposeful amendments their own.To use a high quality and variety of presentation and precision in their design and make.To think deeply and critically about other products and identify the strengths and weaknesses of the designs. |