THAMESIDE PRIMARY SCHOOL

Design and technology progression documenT 2020 ONWARDS

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| **AUTUMN TERM** | | | | |
|  | **Autumn 1** | | **Autumn 2** | |
|  | NurseryHow Many Colours in a Rainbow? | | NurseryIs It Shiny? | |
| EYFS | Moving and Handling   * **E. L. Goal** **151** Children show good control and co-ordination in large and small movements. They move confidently in a range of ways, safely negotiating space. They handle equipment and tools effectively, including pencils for writing. | * **22-36 months** May be beginning to show preference for dominant hand. * **30-50 months** Uses one-handed tools and equipment. * **40-60+ months** Handles tools, objects, construction and malleable materials safely and with increasing control. | Moving and Handling   * **E. L. Goal** **151** Children show good control and co-ordination in large and small movements. They move confidently in a range of ways, safely negotiating space. They handle equipment and tools effectively, including pencils for writing. | * **22-36 months** Squats with steadiness to rest or play with object on the ground, and rises to feet without using hands. * **30-50 months** Draws lines and circles using gross motor movements. * **40-60+ months** Handles tools, objects, construction and malleable materials safely and with increasing control. |
|  | ReceptionWhy Do Squirrels Hide Their Nuts? | | ReceptionWhat Happens When I Fall Asleep? | |
| Moving and Handling   * **E. L. Goal** **121** Children show good control and co-ordination in large and small movements. They move confidently in a range of ways, safely negotiating space. They handle equipment and tools effectively, including pencils for writing. | * **30-50 months** Moves freely and with pleasure and confidence in a range of ways, such as slithering, shuffling, rolling, crawling, walking, running, jumping, skipping, sliding and hopping. * **40-60+ months** Experiments with different ways of moving. * **ELG skills** Move confidently in a range of ways. | Moving and Handling  **E. L. Goal** **121** Children show good control and co-ordination in large and small movements. They move confidently in a range of ways, safely negotiating space. They handle equipment and tools effectively, including pencils for writing. | * **30-50 months** Moves freely and with pleasure and confidence in a range of ways, such as slithering, shuffling, rolling, crawling, walking, running, jumping, skipping, sliding and hopping. * **40-60+ months** Experiments with different ways of moving. * **ELG skills** Move confidently in a range of ways. |
| Year 1 | SUPERHEROES | | BRIGHT LIGHTS, BIG CITY | |
| Skills   * Create a design to meet simple design criteria. * Select healthy ingredients for a fruit or vegetable salad. * Describe the similarities and differences between two products. | Knowledge   * Design criteria are the explicit goals that a project must achieve. * Fruit and vegetables are an important part of a healthy diet. It is recommended that people eat at least five portions of fruit and vegetables every day. * Two products can be compared by looking at a set of criteria and scoring both products against each one. | Skills   * Create a design to meet simple design criteria. * Construct simple structures, models or other products using a range of materials. * Select the appropriate tool for a simple practical task. * Talk about their own and each other's work, identifying strengths or weaknesses with support. * Measure and weigh food items using non-standard measures, such as spoons and cups. * Sort foods into groups by whether they are from an animal or plant source. | Knowledge   * Design criteria are the explicit goals that a project must achieve. * Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. * Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking. * A strength is a good quality of a piece of work. A weakness is an area that could be improved. * Using non-standard measures is a way of measuring that does not involve reading scales. For example, weight may be measured using a balance scale and lumps of plasticine. Length may be measured in the number of handspans or pencils laid end to end. * Some foods come from animals, such as meat, fish and dairy products. Other foods come from plants, such as fruit and vegetables, grains, beans and nuts. |
| Year 2 | MUCK, MESS AND MIXTURES | | STREET DETECTIVES | |
| Skills   * Generate and communicate their ideas through a range of different methods. * Select the appropriate tool for a task and explain their choice. * Explain how closely their finished products meet their design criteria and say what they could do better in the future. * Prepare ingredients by peeling, grating, chopping and slicing. * Describe the types of food needed for a healthy and varied diet and apply the principles to make a simple, healthy meal. * Identify the origin of some common foods (milk, eggs, some meats, common fruit and vegetables). * Work safely and hygienically in construction and cooking activities. | Knowledge   * Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology. * 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. * Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned. * Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: peeling skins using a vegetable peeler, such as potato skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples. * A healthy diet should include meat or fish, starchy foods (such as potatoes or rice), some dairy foods, a small amount of fat and plenty of fruit and vegetables. * Food comes from two main sources: animals and plants. Cows provide beef, sheep provide lamb and mutton and pigs provide pork, ham and bacon. Examples of poultry include chickens, geese and turkeys. Examples of fish include cod, salmon and shellfish. Milk comes mainly from cows but also from goats and sheep. Most eggs come from chickens. Honey is made by bees. Fruit and vegetables come from plants. Oils are made from parts of plants. Sugar is made from plants called sugar cane and sugar beet. Plants also give us nuts, such as almonds, walnuts and hazelnuts. * Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills. | Skills   * Generate and communicate their ideas through a range of different methods. * Select the appropriate tool for a task and explain their choice. * Prepare ingredients by peeling, grating, chopping and slicing. * 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. | Knowledge   * Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology. * 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. * Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: peeling skins using a vegetable peeler, such as potato skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples. * 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. * Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills. |
| Year 3 | MIGHTY METALS | | GODS AND MORTALS | |
| Skills   * Develop design criteria to inform a design. * Create shell or frame structures using diagonal struts to strengthen them. * Use tools safely for cutting and joining materials and components. * Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. * Plan which materials will be needed for a task and explain why. * Incorporate a simple series circuit into a model. * Explore and use a range of mechanisms (levers, sliders, axles, wheels and cams) in models or products. * Explain how an existing product benefits the user. * Use appliances safely with adult supervision. | Knowledge   * 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. * Shell structures are hollow, 3-D structures with a thin outer covering, such as a box. Frame structures are made from thin, rigid components, such as a tent frame. The rigid frame gives the structure shape and support. Diagonal struts can strengthen the structure. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Asking questions can help others to evaluate their product, such as asking them whether the selected materials achieved the purpose of the model. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. * An electric circuit can be used in a model, such as a lighthouse. It can be controlled using a switch. * 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. * Particular products have been designed for specific tasks, such as nail clippers, the spinning top and the cool box. * Electrical appliances must only be used under the supervision of an adult. Safety rules must also be followed when using electricity: fingers and other objects must not be put into electrical outlets, anything with a cord or plug should never be used around water and a plug should never be pulled out by its cord. | Skills   * Develop design criteria to inform a design. * Use tools safely for cutting and joining materials and components. * 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. | Knowledge   * 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. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. * 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. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. |
| Year 4 | BURPS, BOTTOMS AND BILE | | TRADERS AND RAIDERS | |
| Skills   * Use annotated sketches and exploded diagrams to test and communicate their ideas. * 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. * Identify and use a range of cooking techniques to prepare a simple meal. * Design a healthy snack or packed lunch and explain why it is healthy. * Choose from a range of materials, showing an understanding of their different characteristics. * Create and complete a comparison table to compare two or more products. | Knowledge   * Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. * 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. Evaluation also includes suggesting improvements and explaining why they should be made. * A comparison table can be used to compare products by listing specific criteria on which each product can be judged or scored. | Skills   * Use annotated sketches and exploded diagrams to test and communicate their ideas. * Prototype shell and frame structures, showing awareness of how to strengthen, stiffen and reinforce them. * Select, name and use tools with adult supervision. * 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. * Identify and use a range of cooking techniques to prepare a simple meal. * Choose from a range of materials, showing an understanding of their different characteristics. | Knowledge   * 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. Shell and frame structures can be strengthened by gluing several layers of card together, using triangular shapes rather than squares, adding diagonal support struts and using 'Jinks' corners (small, thin pieces of card cut into a right-angled triangle and glued over each joint to straighten and strengthen them). * Useful tools for cutting include scissors, craft knives, junior hacksaws with pistol grip and bench hooks. Useful tools for joining include glue guns. Tools should only be used with adult supervision and safety rules must be followed. * 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. Evaluation also includes suggesting improvements and explaining why they should be made. |
| Year 5 | PHAROAHS | | STARGAZERS | |
| Skills   * Explain how the design of a product has been influenced by the culture or society in which it was designed or made. * Name and select increasingly appropriate tools for a task and use them safely. * Select and combine materials with precision. * Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. * Describe what seasonality means and explain some of the reasons why it is beneficial. | Knowledge   * Culture is the language, inventions, ideas and art of a group of people. A society is all the people in a community or group. Culture affects the design of some products. For example, knives and forks are used in the western world, whereas chopsticks are used mainly in China and Japan. The design of products needs to take into account the culture of the target audience. For example, colours might mean very different things in different cultures. * There are many rules for using tools safely and these may vary depending on the tools being used. For example, someone using a chisel should chip or cut with the cutting edge pointing away from their body. All tools should be cleaned and put away after use, and should not be used if they are loose or cracked. * Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. * Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. Savoury dishes usually have a salty or spicy flavour rather than a sweet one. * 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. | Skills   * Use pattern pieces and computer-aided design packages to design a product. * Name and select increasingly appropriate tools for a task and use them safely. * Test and evaluate products against a detailed design specification and make adaptations as they develop the product. * Select and combine materials with precision. * Explain how the design of a product has been influenced by the culture or society in which it was designed or made. * Explain the functionality and purpose of safety features on a range of products. | Knowledge   * A pattern piece is a drawing or shape used to guide how to make something. There are many different computer-aided design packages for designing products. * There are many rules for using tools safely and these may vary depending on the tools being used. For example, someone using a chisel should chip or cut with the cutting edge pointing away from their body. All tools should be cleaned and put away after use, and should not be used if they are loose or cracked. * Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture. * Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. * Culture is the language, inventions, ideas and art of a group of people. A society is all the people in a community or group. Culture affects the design of some products. For example, knives and forks are used in the western world, whereas chopsticks are used mainly in China and Japan. The design of products needs to take into account the culture of the target audience. For example, colours might mean very different things in different cultures. * Safety features are often incorporated into products that might cause harm. Some examples include the child-safety caps on medicine bottles, seatbelts in cars, covers for electrical sockets and finger guards on doors. |
| Year 6 | BLOODHEART | | A CHILD’S WAR | |
| Skills   * Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. * Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. * Demonstrate modifications made to a product, as a result of ongoing evaluation by themselves and others. * Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. * Choose the best materials for a task, showing an understanding of their working characteristics. | Knowledge   * Design criteria should cover the intended use of the product, age range targeted and final appearance. Ideas can be communicated in a range of ways, including through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. * Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. Triangular shapes can be used instead of square shapes because they are more rigid. Frameworks can be further strengthened by adding an outer cover. * Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. * Ingredients can usually be bought at supermarkets, but specialist shops may stock different items. Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens usually sell some unusual prepared foods, as well as cold meats and cheeses. * It is important to understand the characteristics of different materials to select the most appropriate for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. | Skills   * Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. * Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. * Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. * Plan a healthy weekly diet, justifying why each meal contributes towards a balanced diet. * Choose the best materials for a task, showing an understanding of their working characteristics. | Knowledge   * Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. Triangular shapes can be used instead of square shapes because they are more rigid. Frameworks can be further strengthened by adding an outer cover. * Ingredients can usually be bought at supermarkets, but specialist shops may stock different items. Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens usually sell some unusual prepared foods, as well as cold meats and cheeses. * Eating a balanced diet is a positive lifestyle choice that should be sustained over time. Food that is high in fat, salt or sugar can still be eaten occasionally as part of a balanced diet. * It is important to understand the characteristics of different materials to select the most appropriate for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. |

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| **SPRING TERM** | | | | |
|  | **Spring 1** | | **Spring 2** | |
|  | NurseryWhere Does Snow Go? | | NurseryWhy Is Water Wet? | |
| EYFS  **All E. L. Goals are to be considered in conjunction with the prime areas of learning.** | **E. L. Goal 60** Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. | * **22-36 months** **Nursery** Beginning to make-believe by pretending. * **30-50 months** **Nursery** Builds stories around toys. * **40-60+ months** **Nursery** Introduces a storyline or narrative into their play. | **E. L. Goal 127** Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | * **22-36 months Nursery** Experiments with blocks, colours and marks. * **30-50 months Nursery** Explores colour and how colours can be changed. * **40-60+ months Nursery** Explores what happens when they mix colours. |
| ReceptionWill You Read Me A Story? | | ReceptionAre Carrots Orange? | |
| **E. L. Goal 134** Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | * **30-50 months Reception** Uses various construction materials. * **30-50 months Reception** Joins construction pieces together to build and balance. * **40-60+ months Reception** Manipulates materials to achieve a planned effect. * **40-60+ months Reception** Constructs with a purpose in mind, using a variety of resources. * **ELG skills Reception** Experiments with form. * **Exceeding ELG Reception** Develop their own ideas through selecting and using materials and working on processes that interest them. | **E. L. Goal 74** Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. | * **30-50 months Reception** Engages in imaginative role play based on own first-hand experiences. * **40-60+ months** Reception Introduces a storyline or narrative into their play. * **40-60+ months Reception** Plays alongside other children who are engaged in the same theme. * **ELG skills Reception** Represent their own ideas, thoughts and feelings through role play. |
| Year 1 | DINOSAUR PLANET | | PAWS, CLAWS AND WHISKERS | |
| Skills   * Create a design to meet simple design criteria. * Construct simple structures, models or other products using a range of materials. * Select the appropriate tool for a simple practical task. * Talk about their own and each other's work, identifying strengths or weaknesses with support. * Measure and weigh food items using non-standard measures, such as spoons and cups. * Select and use a range of materials, beginning to explain their choices. | Knowledge   * Design criteria are the explicit goals that a project must achieve. * Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. * Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking. * A strength is a good quality of a piece of work. A weakness is an area that could be improved. * Using non-standard measures is a way of measuring that does not involve reading scales. For example, weight may be measured using a balance scale and lumps of plasticine. Length may be measured in the number of handspans or pencils laid end to end. * Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows. | Skills   * Create a design to meet simple design criteria. * Construct simple structures, models or other products using a range of materials. * Select the appropriate tool for a simple practical task. * Talk about their own and each other's work, identifying strengths or weaknesses with support. * Select and use a range of materials, beginning to explain their choices.   Follow the rules to keep safe during a practical task. | Knowledge   * Design criteria are the explicit goals that a project must achieve. * Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. * A strength is a good quality of a piece of work. A weakness is an area that could be improved. * Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows. * Rules are made to keep people safe from danger. Safety rules include always listening carefully and following instructions, using equipment only as and when directed and wearing protective clothing if appropriate and washing hands before touching food. |
| Year 2 | BEAT BAND BOOGIE | | TOWERS, TUNNELS AND TURRETS | |
| Skills   * Work safely and hygienically in construction and cooking activities. * Explore how a structure can be made stronger, stiffer and more stable. * Select the appropriate tool for a task and explain their choice. * Explain how closely their finished products meet their design criteria and say what they could do better in the future. * Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect. | Knowledge   * Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills. * 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. * 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. * Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned. * 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. | Skills   * Generate and communicate their ideas through a range of different methods. * Explore how a structure can be made stronger, stiffer and more stable. * Explain how closely their finished products meet their design criteria and say what they could do better in the future. * Choose appropriate components and materials and suggest ways of manipulating them to achieve the desired effect. * Explain how an everyday product could be improved. * Explain why a designer or inventor is important. | Knowledge   * Ideas can be communicated in a variety of ways, including written work, drawings and diagrams, modelling, speaking and using information and communication technology. * 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. * Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned. * 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. * Products can be improved in different ways, such as making them easier to use, more hardwearing or more attractive. * Many key individuals have helped to shape the world. These include Isambard Kingdom Brunel (1806––1859), an English engineer who designed the Clifton Suspension Bridge and the Great Western Railway; Archimedes (287––212 BC) an ancient Greek who first described levers and pulleys and Michael Faraday (1791––1867), an English scientist who invented the electric motor and dynamo. |
| Year 3 | HEROES AND VILLAINS | | TRIBAL TALES | |
| Skills   * Develop design criteria to inform a design. * Use tools safely for cutting and joining materials and components. * Plan which materials will be needed for a task and explain why. | Knowledge   * 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. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. | Skills   * Develop design criteria to inform a design. * Create shell or frame structures using diagonal struts to strengthen them. * Use tools safely for cutting and joining materials and components. * Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. * Plan which materials will be needed for a task and explain why. | Knowledge   * 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. * Shell structures are hollow, 3-D structures with a thin outer covering, such as a box. Frame structures are made from thin, rigid components, such as a tent frame. The rigid frame gives the structure shape and support. Diagonal struts can strengthen the structure. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Asking questions can help others to evaluate their product, such as asking them whether the selected materials achieved the purpose of the model. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. |
| Year 4 | PLAYLIST | | POTIONS | |
| Skills   * 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. * Choose from a range of materials, showing an understanding of their different characteristics. * Investigate and identify the design features of a familiar product. | Knowledge   * 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. Evaluation also includes suggesting improvements and explaining why they should be made. * Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. * Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. | Skills   * Investigate and identify the design features of a familiar product. * Work safely with everyday chemical products under supervision, such as disinfectant hand wash and surface cleaning spray. * Use annotated sketches and exploded diagrams to test and communicate their ideas. * Select, name and use tools with adult supervision. * 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. * Choose from a range of materials, showing an understanding of their different characteristics. | Knowledge   * Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. * Chemicals are used in the home every day. They include cleaning products, such as bleach and disinfectant, but also paints, glues, oils, pesticides and medicines. Most chemical products carry a hazard symbol showing in what way the chemical could be harmful. Chemicals should only be used under adult supervision. Appropriate safety precautions, such as wearing goggles and gloves, working in a well-ventilated room, wiping up spills and tying back long hair, should be taken. * Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. * Useful tools for cutting include scissors, craft knives, junior hacksaws with pistol grip and bench hooks. Useful tools for joining include glue guns. Tools should only be used with adult supervision and safety rules must be followed. * 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. Evaluation also includes suggesting improvements and explaining why they should be made. * Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. |
| Year 5 | PEASANTS, PRINCES AND PESTILLENCE | | SOW, GROW AND FARM | |
| Skills   * Name and select increasingly appropriate tools for a task and use them safely. * Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish.   Select and combine materials with precision. | Knowledge   * There are many rules for using tools safely and these may vary depending on the tools being used. For example, someone using a chisel should chip or cut with the cutting edge pointing away from their body. All tools should be cleaned and put away after use, and should not be used if they are loose or cracked. * Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. Savoury dishes usually have a salty or spicy flavour rather than a sweet one. * Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. | Skills   * 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. * Describe what seasonality means and explain some of the reasons why it is beneficial. | Knowledge   * Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. Savoury dishes usually have a salty or spicy flavour rather than a sweet one. * A balanced diet gives your body all the nutrients it needs to function correctly. This means eating a wide variety of foods in the correct proportions. * 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. |
| Year 6 | FROZEN KINGDOM | | DARWIN’S DELIGHTS | |
| * 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. | * Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. Triangular shapes can be used instead of square shapes because they are more rigid. Frameworks can be further strengthened by adding an outer cover. * It is important to understand the characteristics of different materials to select the most appropriate for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. | * Choose the best materials for a task, showing an understanding of their working characteristics. | * It is important to understand the characteristics of different materials to select the most appropriate for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. |

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| **SUMMER TERM** | | | | |
|  | **Summer 1** | | **Summer 2** | |
|  | NurseryCan We Explore It? | | NurseryHow Does That Building Stay Up? | |
| EYFS  **All E. L. Goals are to be considered in conjunction with the prime areas of learning.** | **E. L. Goal 60** Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. | * **22-36 months** **Nursery** Beginning to make-believe by pretending. * **30-50 months** **Nursery** Builds stories around toys. * **40-60+ months** **Nursery** Introduces a storyline or narrative into their play. | **E. L. Goal 127** Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | * **22-36 months Nursery** Experiments with blocks, colours and marks. * **30-50 months Nursery** Explores colour and how colours can be changed. * **40-60+ months Nursery** Explores what happens when they mix colours. |
| ReceptionWhy Do Ladybirds Have Spots? | | ReceptionAre We There Yet? | |
| **E. L. Goal 134** Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | * **30-50 months Reception** Uses various construction materials. * **30-50 months Reception** Joins construction pieces together to build and balance. * **40-60+ months Reception** Manipulates materials to achieve a planned effect. * **40-60+ months Reception** Constructs with a purpose in mind, using a variety of resources. * **ELG skills Reception** Experiments with form. * **Exceeding ELG Reception** Develop their own ideas through selecting and using materials and working on processes that interest them. | **E. L. Goal 74** Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories. | * **30-50 months Reception** Engages in imaginative role play based on own first-hand experiences. * **40-60+ months** Reception Introduces a storyline or narrative into their play. * **40-60+ months Reception** Plays alongside other children who are engaged in the same theme. * **ELG skills Reception** Represent their own ideas, thoughts and feelings through role play. |
| Year 1 | SPLENDID SKIES | | RIO DE VIDA | |
| Skills   * Name and explore a range of everyday products and describe how they are used. * Construct simple structures, models or other products using a range of materials. * Select and use a range of materials, beginning to explain their choices. | Knowledge   * Everyday products are objects that are used routinely at home and school, such as a toothbrush, cup or pencil. All products are designed for a specific purpose. * Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. * Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows. | Skills   * Create a design to meet simple design criteria * Construct simple structures, models or other products using a range of materials. * Select the appropriate tool for a simple practical task. * Talk about their own and each other's work, identifying strengths or weaknesses with support. * Measure and weigh food items using non-standard measures, such as spoons and cups. * Select and use a range of materials, beginning to explain their choices. * Follow the rules to keep safe during a practical task. | Knowledge   * Design criteria are the explicit goals that a project must achieve. * Different materials can be used for different purposes, depending on their properties. For example, cardboard is a stronger building material than paper. Plastic is light and can float. Clay is heavy and will sink. * Specific tools are used for particular purposes. For example, scissors are used for cutting and glue is used for sticking. * A strength is a good quality of a piece of work. A weakness is an area that could be improved. * Different materials are suitable for different purposes, depending on their specific properties. For example, glass is transparent, so it is suitable to be used for windows. * Rules are made to keep people safe from danger. Safety rules include always listening carefully and following instructions, using equipment only as and when directed and wearing protective clothing if appropriate and washing hands before touching food. |
| Year 2 | WRIGGLE AND CRAWL | | COASTLINE | |
| Skills   * Select the appropriate tool for a task and explain their choice. * Explain how closely their finished products meet their design criteria and say what they could do better in the future. * Prepare ingredients by peeling, grating, chopping and slicing. * 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. | Knowledge   * 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. * Finished products can be compared with design criteria to see how closely they match. Improvements can then be planned. * Some ingredients need to be prepared before they can be cooked or eaten. There are many ways to prepare ingredients: peeling skins using a vegetable peeler, such as potato skins; grating hard ingredients, such as cheese or chocolate; chopping vegetables, such as onions and peppers and slicing foods, such as bread and apples. * 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. * Hygiene rules include washing hands before handling food, cleaning surfaces, tying long hair back, storing food appropriately and wiping up spills. | Skills   * Explore how a structure can be made stronger, stiffer and more stable. | Knowledge   * 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. |
| Year 3 | SCRUMDIDDLIUMPTIOUS | | FLOW | |
| Skills   * Develop design criteria to inform a design. * Use tools safely for cutting and joining materials and components. * Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. * Prepare and cook a simple savoury dish. * Identify the main food groups (carbohydrates, protein, dairy, fruits and vegetables, fats and sugars). * Identify and name foods that are produced in different places. * Explain how an existing product benefits the user. * Use appliances safely with adult supervision. | Knowledge   * 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. * Specific tools can be used for cutting, such as saws. Wood can be joined using glue, nails, staples or a combination. Safety rules must be followed to prevent injury from sharp blades. These rules include using a bench hook to keep the wood still, using a junior hacksaw with a pistol grip and working under adult supervision. * Asking questions can help others to evaluate their product, such as asking them whether the selected materials achieved the purpose of the model. * Preparation techniques for savoury dishes include peeling, chopping, deseeding, slicing, dicing, grating, mixing and skinning. * There are five main food groups that should be eaten regularly as part of a balanced diet: fruit and vegetables; carbohydrates (potatoes, bread, rice and pasta); proteins (beans, pulses, fish, eggs and meat); dairy and alternatives (milk, cheese and yoghurt) and fats (oils and spreads). Foods high in fat, salt and sugar should only be eaten occasionally as part of a healthy, balanced diet. * 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. 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. * Electrical appliances must only be used under the supervision of an adult. Safety rules must also be followed when using electricity: fingers and other objects must not be put into electrical outlets, anything with a cord or plug should never be used around water and a plug should never be pulled out by its cord. | Skills   * Create shell or frame structures using diagonal struts to strengthen them. * Suggest improvements to their products and describe how to implement them, beginning to take the views of others into account. * 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. | Knowledge   * Shell structures are hollow, 3-D structures with a thin outer covering, such as a box. Frame structures are made from thin, rigid components, such as a tent frame. The rigid frame gives the structure shape and support. Diagonal struts can strengthen the structure. * Asking questions can help others to evaluate their product, such as asking them whether the selected materials achieved the purpose of the model. * Materials for a specific task must be selected on the basis of their properties. These include physical properties as well as availability and cost. * 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. |
| Year 4 | ROAD TRIP USA | | BLUE ABYSS | |
| Skills   * Use annotated sketches and exploded diagrams to test and communicate their ideas. * 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. * Identify and use a range of cooking techniques to prepare a simple meal. * Choose from a range of materials, showing an understanding of their different characteristics. * Investigate and identify the design features of a familiar product. | Knowledge   * Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. * 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. Evaluation also includes suggesting improvements and explaining why they should be made. * Cooking techniques include baking, boiling, frying, grilling and roasting. * Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. * Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. | Skills   * Use annotated sketches and exploded diagrams to test and communicate their ideas. * 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. * Choose from a range of materials, showing an understanding of their different characteristics. * Incorporate circuits that use a variety of components into models or products. * Investigate and identify the design features of a familiar product. * Explain how and why a significant designer or inventor shaped the world. | Knowledge   * Annotated sketches and exploded diagrams show specific parts of a design, highlight sections or show functions. They communicate ideas in a visual, detailed way. * 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. Evaluation also includes suggesting improvements and explaining why they should be made. * Different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. Recipe ingredients have different tastes and appearances. They look and taste better and are cheaper when in season. * Components can be added to circuits to achieve a particular goal. These include bulbs for lighthouses and torches, buzzers for burglar alarms and electronic games, motors for fairground rides and motorised vehicles and switches for burglar alarms and games. * Design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. * Significant designers and inventors include Leonardo da Vinci (1452–1519), who designed a helicopter and tank; Thomas Edison (1847–1931), who invented the phonograph and electric lightbulb and Tim Berners-Lee (1955–), who invented the World Wide Web. |
| Year 5 | TIME TRAVELLER | | SCREAM MACHINE | |
| Skills   * Select and combine materials with precision. | Knowledge   * Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. | Skills   * Use pattern pieces and computer-aided design packages to design a product. * Link a physical device to a computer or tablet so that it can be controlled (such as changing motor speed or turning an LED on and off) by a program. * Build a framework using a range of materials to support mechanisms. * Name and select increasingly appropriate tools for a task and use them safely. * Test and evaluate products against a detailed design specification and make adaptations as they develop the product. * Use an increasing range of preparation and cooking techniques to cook a sweet or savoury dish. * Select and combine materials with precision. * Use mechanical systems in their products, such as pneumatics and hydraulics. * Explain how the design of a product has been influenced by the culture or society in which it was designed or made. * Explain the functionality and purpose of safety features on a range of products. | Knowledge   * A pattern piece is a drawing or shape used to guide how to make something. There are many different computer-aided design packages for designing products. * Equipment and devices can be controlled by pressing buttons on a control panel, such as on a washing machine or microwave. * 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. * There are many rules for using tools safely and these may vary depending on the tools being used. For example, someone using a chisel should chip or cut with the cutting edge pointing away from their body. All tools should be cleaned and put away after use, and should not be used if they are loose or cracked. * Testing a product against the design criteria will highlight anything that needs improvement or redesign. Changes are often made to a design during manufacture. * Sweet dishes are usually desserts, such as cakes, fruit pies and trifles. Savoury dishes usually have a salty or spicy flavour rather than a sweet one. * Materials should be cut and combined with precision. For example, pieces of fabric could be cut with sharp scissors and sewn together using a variety of stitching techniques. * 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. Hydraulic mechanisms work in a similar way, but instead of air, the system is filled with a liquid, usually water. It is important that the system is air or watertight. * Culture is the language, inventions, ideas and art of a group of people. A society is all the people in a community or group. Culture affects the design of some products. For example, knives and forks are used in the western world, whereas chopsticks are used mainly in China and Japan. The design of products needs to take into account the culture of the target audience. For example, colours might mean very different things in different cultures. * Safety features are often incorporated into products that might cause harm. Some examples include the child-safety caps on medicine bottles, seatbelts in cars, covers for electrical sockets and finger guards on doors. |
| Year 6 | HOLA MEXICO | | TOMORROW’S WORLD | |
| Skills   * Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. * Select the most appropriate materials and frameworks for different structures, explaining what makes them strong. * Select appropriate tools for a task and use them safely and precisely. * Demonstrate modifications made to a product, as a result of ongoing evaluation by themselves and others. * Follow a recipe that requires a variety of techniques and source the necessary ingredients independently. * Plan a healthy weekly diet, justifying why each meal contributes towards a balanced diet. * Choose the best materials for a task, showing an understanding of their working characteristics. | Knowledge   * Design criteria should cover the intended use of the product, age range targeted and final appearance. Ideas can be communicated in a range of ways, including through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. * Strength can be added to a framework by using multiple layers. For example, corrugated cardboard can be placed with corrugations running alternately vertically and horizontally. Triangular shapes can be used instead of square shapes because they are more rigid. Frameworks can be further strengthened by adding an outer cover. * Precision is important in producing a polished, finished product. Correct selection of tools and careful measurement can ensure the parts fit together correctly. * Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. * Ingredients can usually be bought at supermarkets, but specialist shops may stock different items. Greengrocers sell fruit and vegetables, butchers sell meat, fishmongers sell fresh fish and delicatessens usually sell some unusual prepared foods, as well as cold meats and cheeses. * Eating a balanced diet is a positive lifestyle choice that should be sustained over time. Food that is high in fat, salt or sugar can still be eaten occasionally as part of a balanced diet. * It is important to understand the characteristics of different materials to select the most appropriate for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. | Skills   * Analyse how an invention or product has significantly changed or improved people's lives. * 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. * Develop design criteria for a functional and appealing product that is fit for purpose, communicating ideas clearly in a range of ways. * Use a sensor to monitor an environmental variable, such as temperature, sound or light. * 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. * Present a detailed account of the significance of a favourite designer or inventor. | Knowledge   * People's lives have been improved in countless ways due to new inventions and designs. For example, the Morrison shelter, designed by John Baker in 1941, was an indoor air-raid shelter used in over half a million homes during the Second World War. It saved the lives of many people caught in bombing raids. * The safety of the user has to be taken into account when designing a new product. Methods to help keep users safe include providing clear instructions for use; clear indication of the age range for which it is designed; safety features (such as child-resistant packaging); warning symbols and electrical safety checks. * Mechanical systems can include sliders, levers, linkages, gears, pulleys and cams. Other mechanisms include pneumatics and hydraulics. * Design criteria should cover the intended use of the product, age range targeted and final appearance. Ideas can be communicated in a range of ways, including through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. * Computer monitoring uses sensors as a scientific tool to record information about environmental changes over time. Computer monitoring can also log data from sensors and record the resulting information in a table or graph. * Design is an iterative process, meaning alterations and improvements are made continually throughout the manufacturing process. Evaluating a product while it's being manufactured, and explaining these evaluations to others, can help to refine it. * It is important to understand the characteristics of different materials to select the most appropriate material for a purpose. This might include flexibility, waterproofing, texture, colour, cost and availability. * The significance of a designer or inventor can be measured in various ways. Their work may benefit society in health, transport, communication, education, the built environment or technology. It may enhance culture in different areas, such as fashion, ceramics or computer games. |