**Art and Design Long Term Plan**

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| **Autumn 1** | **AUTUMN 2** | **SPRING 1** | **SPRING 2** | **SUMMER 1** | **SUMMER 2** |
| **YEAR 1** | | | | | |
| **Mechanical Components**   * To talk about the purpose of a wheel. * To talk about their own experience of vehicles with wheels. * To talk about designs for vehicles to carry a toy. * To make a drawing of a design for a four-wheel vehicle to carry a toy. * To experiment with construction kits to make an object that moves. * To attach wheels to a chassis using an axle with cotton reels and dowels. * To attach wheels to a chassis using an axle with straws and paper wheels/ circles. * To suggest reasons why a wheel and axle wobbles based on hole position. * To talk about why their vehicle moves. * To say what is similar about their and another vehicle. * To recognise the different between fixed and freely moving axles. * To understand what a wheel, chassis and axle is. |  |  | **Food and Nutrition**   * To understand that food comes from plants and animals. * To sort fruits and vegetables based on colour, texture and taste. * To understand that everyone should eat at least five portions of fruit and vegetables every day. * To understand what a healthy meal is. * To understand that hands and utensils need to be washed before cooking. * To use a knife to cut fruit and vegetables into smaller pieces. * To understand how to hold fruit and vegetables so that they can be cut safely.   To use a spoon to mix. |  |  |
| **YEAR 2** | | | | | |
| **Construction**   * To talk about existing structures. * To use pictures and words to plan and design a free-standing structure linked to London. * To make and use templates. * To make simple mock-ups of structures. * To experiment with building free-standing structures using Lego and Polydron. * To use folding as a strengthening technique. * To use scissors to cut card and paper accurately. * To use a straight edge to mark lines for cutting. * To select suitable equipment to join materials (glue, tape, staples). * To layer materials as a finishing technique to make them more appealing for the intended user. * To learn about the designer Sir Christopher Wren and describe his work. * To learn about designers of influential London landmarks (e.g. Sir Charles Barry, John Nash). * To say what they like and dislike about existing free-standing structures, referring to suitability of materials and stability. * To recognise the intended user of a free-standing structure. * To talk about what they have constructed and the techniques involved. * To describe what they like about their own and partners’ structure. * To suggest one way the structure could have been changed by using a different construction material or joining technique. * To talk about different construction materials. * To describe how stable a structure is. * To understand how a free-standing structure can be made more stable, stiffer and stronger. |  |  | **Textiles**   * To talk about existing textile designs and print patterns. * To use pictures and words to plan and design a textile product. * To use IT to plan and design a textile product. * To make and use templates. * To use pins as a way of securing material and templates. * To use chalk to draw around a template. * To use scissors to cut templates and material accurately. * To use a straight edge to mark lines for cutting. * To select suitable equipment to join different parts of materials (glue, sewing, staples, pins). * To say what they like and dislike about joining with sewing, gluing and pinning based on comfort and aesthetic choices. * To evaluate different fabrics. * To sew using overstitch. * To understand the purpose of a template. * To select a chosen fabric based on its properties. * To apply finishing techniques of stencil printing and gluing.   **Food and Nutrition**   * To state foods that come from plants and animals. * To recognise foods relating to the Mexican culture. * To sort foods based on where they have come from (farmed, grown elsewhere or caught). * To suggest ways that at least five portions of fruit and vegetables can be eaten every day. * To understand what a varied and healthy diet is, using the Eatwell Guide. * To describe steps to take so that food is prepared hygienically. * To use a knife to peel fruit and vegetables and to discard pips/ seeds. * To understand how to use a grater safely. * To use a spoon to measure quantities. |  |  |
| **YEAR 3** | | | | | |
|  | **Construction**   * To use research and previous learning to inform designs for a free-standing structure. * To use labelled sketches and instructions to plan a design for a functional free-standing structure linked to the Iron Age. * To test simple mock-ups of structure supports (including buttresses) * To build free-standing structures that are supported by a buttress. * To use scissors to score construction material. * To draw accurate cutting lines using a ruler. * To select suitable joining materials that provide hidden joins (glue, double-sided tape). * To compare designs and support structures of chairs created by Ludwig Mies Van Der Rohe. * To evaluate different ways of supporting a free-standing structure. * To evaluate how well a design is functional. * To talk about ways their free-standing structure is supported and can hold weight. * To suggest ways a structure could be altered whilst still meeting the intended user’s needs. * To talk about the suitable properties of construction materials. * To explain what a buttress is. | **Electrical Components**   * To use research and historical knowledge to inform designs for a mining helmet circuit. * To use labelled sketches and instructions to plan a design for a mining helmet circuit. * To test different circuit components * To make different electrical systems. * To evaluate how some key designs of engineers in design and technology have helped shape the world. * To suggest ways mining helmets could change in the future. * To evaluate different designs of mining helmet and how they meet the intended design purpose. * To talk about ways their mining helmet functions electronically. * To suggest ways their mining helmet could be altered to improve efficiency. * To understand that electrical systems have an input, process and output. * To know that electrical circuits and components can be used to create functional products. * To understand what components a circuit requires. * To recognise designs that require electrical circuits to be functional. * To understand how to construct a circuit. |  | **Mechanical Components**   * To use research and historical knowledge to inform designs for a Shaduf. * To use labelled sketches and instructions to plan a design for a Shaduf. * To test different levers and pulleys for weight bearing. * To make levers and pulleys that can lift different loads from a surface. * To vary the position of the fulcrum to lift a load using a lever. * To strengthen structures using previous learning. * To compare Egyptian Shaduf designs with their own. * To contrast Egyptian Shadufs with modern designs that use pulleys and levers. * To evaluate how well their design lifts varying loads. * To suggest ways their Shaduf could be altered to improve efficiency with the support of their peers. * To recognise the difference between a lever and a pulley. * To understand how to adapt a lever and a pulley based on load weight. * To understand how pulleys and levers create movement. | **Food and Nutrition**   * To understand that the Ancient Egyptians developed fermentation. * To state some foods that contain gluten and yeast. * To discuss about the way in which food processing can affect the taste, appearance, texture and colour of bread. * To understand the need for covering dough to maintain hygiene during benching and proofing. * To effectively disinfect surfaces. * To develop kneading techniques and understand why a floured surface is required. * To weigh dry ingredients using scales. * To use a measuring jug. |
| **YEAR 4** | | | | | |
| **Construction**   * To use evaluation of previous construction to design a shell-structure. * To gather information about a user’s wants and needs. * To use CAD (computer-aided design) to model and explain ideas. * To experiment with the construction of nets and domed shell-structures. * To understand that corrugating, laminating and ribbing can be used to strengthen shell-structures. * To use scissors to score joining flaps. * To use computer-aided finishing techniques. * To give strengths and limitations of existing packaging and domed shell-structures. * To evaluate the positions of where to join a shell-structure. * To evaluate how well a design protects the intended object. * To compare and contrast their design with their peers. * To deconstruct nets and domed shell-structures. * To understand how to strengthen a structure using corrugation, ribbing and lamination. |  |  |  | **Textiles**   * To gather information about a user’s wants and needs. * To create annotated sketches of sewing techniques for a textile creation. * To generate prototypes of knife pleats, hems and gathers. * To use pins to join materials before stitching. * To use measurement ratios to create a template that is to scale. * To experiment with different ways of cutting fabric for aesthetic reasons and to prevent fraying. * To experiment with and select different ways of gathering material as a finishing technique. * To give strengths and limitations of back stitch, catch stitch and running stitch as joining techniques. * To compare and contrast ways of folding material (e.g. knife pleat and gathers) * To compare and contrast their design with their peers. * To sew using back stitch, running stitch and catch stitch. * To understand that a hem should be hidden. * To use folding of material (e.g. hems and pleats) as a finishing technique. | **Construction**   * To create annotated sketches of reinforcing techniques for a frame structure. * To generate prototypes of diagonal braces, gussets and butt joints. * To use a saw to cut wood safely. * To measure wood accurately. * To draw joining flaps accurately so that they can’t be seen on the finished product. * To select suitable materials for reinforcing corners of wood * To compare and contrast butt joints, diagonal braces and gussets as techniques to strengthen a structure. * To explain ways their frame is supported and stable. * To compare and contrast their design with their peers. * To understand how to strengthen a frame using gussets and diagonal braces. |
| **YEAR 5** | | | | | |
|  |  |  | **Mechanical Components**   * To use previous learning and scientific context to inform designs for a functional product with mechanical components. * To collect data on a user’s wants and needs via a survey or interview. * To use exploded diagrams to demonstrate design ideas. * To create prototypes to evaluate an initial design. * To use construction kits with gears to mesh gears at right angles. * To make mechanical systems that involve the correct ratio (in gears: teeth to spin; in pulleys: length of pulley to frequency of turn). * To analyse and evaluate current designs that use mechanical components relating to intended user and purpose. * To evaluate their own and their peers’ designs relating to efficiency and smoothness of movement at different points in the design process. * To recognise the mechanical differences between fixed, moveable and compound pulleys. * To understand how pulleys that are joined in different ways create movement * To understand how gear systems that are joined in different ways create movement. |  |  |
| **YEAR 6** | | | | | |
|  |  | **Electrical Components**   * To use previous learning and historical context to inform designs for a functional product with an electrical component linked to WWII (e.g. air raid siren). * To create detailing drawings and plans drawn to scale. * To make different series circuits comprising of different numbers of cells, buzzers and bulbs. * To apply scientific knowledge to alter a circuit for its functionality. * To use a computer control program to enable an electrical product to work automatically in response to changes in the environment. * To understand developments in D&T and its impact on individuals and society. * To evaluate different electrical components and circuits and explain fully how electrical input and output us affected. * To know how more complex electrical circuits and components can be used to create functional products. * To know how to program a computer to control products. * To understand how circuit design affects output and functionality. | |  | **Food and Nutrition**   * To know that food is grown, reared and caught in the UK, Europe and the wider world. * To recognise food products that are imported from South America. * To understand seasonality. * To understand that seasons affect food availability. * To understand the difference between cage-reared and free-range eggs. * To understand that different food and drink contain different substances (nutrients, water and fibre) that are needed for health. * To use knowledge of cooking and nutrition to adapt recipes. * To maintain a high level of hygiene when preparing food, including the use of different cloths for different surfaces to prevent cross-contamination. * To use a knife to peel, chop, dice and slice fresh ingredients for a savoury dish. * To demonstrate safety measures when using a heat source. * To accurately scale a recipe up or down. * To accurately measure ingredients using standard units of measurement. |