**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.
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| **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.
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| **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.
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| **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.
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| **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.
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