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**Planning and Progression: Design and Technology**

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| **Topics** | **FS** | **Y1/2** | **Y3/4** | **Y5/6** |
| My World, Seasons and CelebrationsWonderful Weather, We are HeroesTerrific tales, Watch it Grow | CYCLE ALondonTransportMe On My MapBridgesWater’s Edge | CYCLE BPuppetsHistory of ToysExplorersGrimsby and IndiaVictorian CleethorpesOur Seaside | CYCLE ANatural DisastersRomansTudorsAmazon RainforestAncient EgyptRivers | CYCLE BChocolate: From bean to barThe Mayan CivilisationGrimsby Heritage CentreOur Local AreaPrehistoric BritainCoastlines | CYCLE AWW2ShackletonExtreme EnvironmentsOlympic Legacies | CYCLE BTown and CountryGuy FawkesViking RaidersFair TradeKeen To Be Green |
| **Designing** | * Select appropriate resources
* Use gestures, talking and arrangements of materials and components to show design.
* Use contexts set by the teacher and themselves.
* Use language of designing and making (join, build, shape, longer, shorter, heavier etc.).
 | * Use their knowledge of existing products and their own experience to help generate their ideas.
* Design products that have a purpose and are aimed at an intended user.
* Explain how their products will look and work through talking and simple annotated drawings.
* Design models using simple computing software.
* Plan and test ideas using templates and prototypes.
* Understand and follow simple design criteria.
* Work in a range of relevant contexts, for example imaginary, story-based, home, school and the wider environment.
 | * Identify the design features of their products that will appeal to intended customers.
* Use their knowledge of a broad range of existing products to help generate their ideas.
* Design innovative and appealing products that have a clear purpose and are aimed at a specific user.
* Explain how particular parts of their products work.
* Use annotated sketches and cross-sectional drawings to develop and communicate their ideas.
* When designing, explore different initial ideas before coming up with a final design.
* When planning, start to explain their choice of materials and components including function and aesthetics.
* Test ideas out through using prototypes.
* Develop and follow simple design criteria.
* Work in a broader range of relevant contexts, for example entertainment, the home, school, leisure, food industry and the wider environment.
 | * Use research to inform and develop detailed design criteria to inform the design of innovative, functional and appealing products that are fit for purpose and aimed at a target market.
* Use their knowledge of a broad range of existing products to help generate their ideas.
* Design products that have a clear purpose and indicate the design features of their products that will appeal to the intended user.
* Explain how particular parts of their products work.
* Use annotated sketches, cross-sectional drawings and exploded diagrams (possibly including computer-aided design) to develop and communicate their ideas.
* Generate a range of design ideas and clearly communicate final designs.
* Consider the availability and costings of resources when planning out designs.
* Work in a broad range of relevant contexts, for example conservation, the home, school, leisure, culture, enterprise, industry and the wider environment.
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| **Making** | **Food*** Mix or assemble ingredients.

**Materials*** Cut materials safely using tools provided under supervision Develop a range of cutting and shaping techniques (such as tearing, cutting, and folding). Develop a range of joining techniques (such as gluing, sticking or combining materials to strengthen).

**Construction*** Use materials to practise gluing materials to make and strengthen products.
 | **Food*** Measure or weigh using measuring cups or electronic scales.
* Assemble or cook ingredients.

**Materials*** Cut materials safely using tools provided. Measure and mark out to the nearest centimetre.
* Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).
* Demonstrate a range of joining techniques (such as gluing or combining materials to strengthen).

**Textiles*** Shape textiles using templates.
* Join textiles using different methods e.g. stapling, gluing or stitching.
* Colour and decorate textiles using a number of techniques (such as using fabric pens, adding sequins).

**Construction*** Use materials to practise gluing materials to make and strengthen products.
 | **Food*** Cut, peel or grate ingredients safely. Prepare ingredients hygienically using appropriate utensils.
* Measure ingredients to the nearest gram accurately.
* Follow a recipe.
* Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).

**Materials*** Cut materials accurately and safely by selecting appropriate tools.
* Measure and mark out to the nearest millimetre.
* Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).
* Select appropriate joining techniques.

**Textiles*** Understand the need for a seam allowance.
* Join textiles with appropriate stitching. Select the most appropriate techniques to decorate textiles.

**Construction*** Choose suitable techniques to construct products or to repair items.

**Electricals and Electronics*** Create a model involving a simple electronic circuit.
 | **Food*** Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.
* Demonstrate a range of baking and cooking techniques.
* Create and refine recipes, including ingredients, methods, cooking times and temperatures.
* Demonstrate knowledge of seasonality.

**Materials*** Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).
* Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).

**Textiles*** Ensure designs include a seam allowance.
* Join textiles with a range of stitching techniques, select the most appropriate techniques to construct, strengthen and decorate textiles.

**Electricals and Electronics*** Create circuits using electronics kits that employ a number of components.

**Computing*** Write code to control and monitor models or products.

**Construction*** Develop a range of practical skills to create products (such as cutting and gluing).
* Strengthen materials using suitable techniques.

**Mechanics*** Convert rotary motion to linear using cams.
* Use combinations of electronics (or computing) and mechanics in product designs.
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| **Evaluating** | * Adapt work if necessary.
* Dismantle, examine, and talk about existing objects/structures.
* Consider and manage some risks.
* Practise some appropriate safety measures independently.
* Talk about how things work.
* Look at similarities and differences between existing objects/materials/tools.
* Show an interest in technological toys.
* Describe textures.
 | * Explore and evaluate existing products mainly through discussions, comparisons and simple written evaluations.
* Explain positives and things to improve for existing products.
* Explore what materials products are made from.
* As they work, start to identify strengths and possible changes they might make to refine their existing design.
* Evaluate their products and ideas against their simple design criteria
* Start to understand that the improving work sometimes involves repeating different stages of the process.
 | * Explore and evaluate existing products, explaining the purpose of the product and whether it is designed well to meet the intended purpose.
* Explore what materials/ingredients products are made from and suggest reasons for this.
* Consider their design criteria as they make progress and alter their plans, sometimes considering the views of others if this helps them to improve their product.
* Evaluate their product against their original design criteria.
 | * Complete detailed competitor analysis of other products on the market.
* Critically evaluate the quality of design, manufacture and fitness for purpose of products as they design and make.
* Evaluate their ideas and products against the original design criteria, making changes as needed.
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| **Technical Knowledge and Understanding** |  | * Know how to make freestanding structures stronger, stiffer and more stable.
* Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.
* Understand and use basic principles of a healthy and varied diet.
* Understand that different mechanisms produce different types of movement.
* Understand how simple 3-D textile products are made, using a template to create two identical shapes.
* Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.
* Explore and use sliders and levers.
* Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.
* Explore and use wheels, axles and axle holders.
* Distinguish between fixed and freely moving axles.
 | * Know how to strengthen, stiffen and reinforce existing fabrics.
* Know how to use appropriate equipment and utensils to prepare and combine food.
* Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.
* Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell Plate.
* Know and use relevant technical and sensory vocabulary appropriately.
* Understand how to securely join two pieces of fabric together.
* Understand the need for patterns and seam allowances.
* Understand and use lever and linkage mechanisms.
* Understand and use electrical systems in their products, such as circuits incorporating switches, bulbs and buzzers.
* Develop and use knowledge of how to construct strong, stiff shell structures.
* Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.
 | * Know how to use utensils and equipment including heat sources to prepare and cook food.
* Understand about seasonality in relation to food products and the source of different food products.
* Know and use relevant technical and sensory vocabulary.
* A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.
* Fabrics can be strengthened, stiffened and reinforced where appropriate.
* Understand how to strengthen, stiffen and reinforce 3-D frameworks.
* Know and use technical vocabulary relevant to the project.
* Continually evaluate and modify the working features of the product to match the initial design specification.
* Test their work to demonstrate its effectiveness for the intended user and purpose.
* Apply their understanding of computing to program, monitor and control their products.
* Understand that mechanical and electrical systems have an input, process and an output.
* Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.
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