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| Objective |  | Key skills | What we will learn | | Key concepts |
| Key Knowledge | Key vocabulary |
| **To master practical skills** | 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. | **Know:**  That food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.  That seasons may affect the food available.  How food is processed into ingredients that can be eaten or used in cooking.  How to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source  How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking  That a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plate  That to be active and healthy, food and drink are needed to provide energy for the body  That recipes can be adapted to change the appearance, taste, texture and aroma  That different food and drink contain different substances – nutrients, water and fibre – that are needed for health | Processed  Seasonal  peeling, chopping, slicing, grating, mixing, spreading, kneading and baking  variety and balance  appearance, taste, texture and aroma  temperature  method | Health  Seasonality  Balance  Taste  Nutrition  Hygiene  Measurement  Accuracy |
| 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). | **Know how to:**  Select tools and equipment suitable for the task  Explain their choice of tools and equipment in relation to the skills and techniques they will be using  Select materials and components suitable for the task  Explain their choice of materials and components according to functional properties and aesthetic qualities  Produce appropriate lists of tools, equipment and materials that they need  Formulate step-by-step plans as a guide to making  Follow procedures for safety and hygiene  Use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components  Accurately measure, mark out, cut and shape materials and components  Accurately assemble, join and combine materials and components  Accurately apply a range of finishing techniques, including those from art and design  Use techniques that involve a number of steps  Demonstrate resourcefulness when tackling practical problems  How to use learning from science to help design and make products that work  How to use learning from mathematics to help design and make products that work  That materials have both functional properties and aesthetic qualities  That materials can be combined and mixed to create more useful characteristics  That mechanical and electrical systems have an input, process and output  The correct technical vocabulary for the projects they are undertaking  How mechanical systems such as cams or pulleys or gears create movement  How more complex electrical circuits and components can be used to create functional products  How to program a computer to monitor changes in the environment and control their products  How to reinforce and strengthen a 3D framework  That a 3D textiles product can be made from a combination of fabric shapes  That a recipe can be adapted by adding or substituting one or more ingredients | Component  precision | Suitability  Quality  Appropriateness |
| Textiles | • Create objects (such as a cushion) that employ a seam allowance.  • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).  • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion). | back stitch  running stitch  decoration  visual  tactile | Accuracy  Visual  Tactile |
| Electricals and electronics | • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips). | Component | Coding |
| Computing | • Write code to control and monitor models or products. | Code  LED |  |
| Construction | • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding). | cutting, drilling and screwing, nailing, gluing, filing and sanding |  |
| Mechanics | • Convert rotary motion to linear using cams.  • Use innovative combinations of electronics (or computing) and mechanics in product designs. | Mechanical  Electrical  cams  pulleys  gears  complex  combine  reinforce  strengthen | Motion  Force  Mechanical  Electrical  Innovation  Control  Adaptation  Strengthen  3-dimensional  Use/user |
| **To design, make, evaluate and improve** |  | • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).  • Make products through stages of prototypes, making continual refinements.  • Ensure products have a high quality finish, using art skills where appropriate.  • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. | **Know how to:**  Identify the strengths and areas for development in their ideas and products  Consider the views of others, including intended users, to improve their work  Refer to their design criteria as they design and make and use their design criteria to evaluate their completed products  Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make  Evaluate their ideas and products against their original design specification  Carry out research, using surveys, interviews, questionnaires and web-based resources  Identify the needs, wants, preferences and values of particular individuals and groups; describe the purpose of their products; indicate the design features of their products that will appeal to intended users  Explain how particular parts of their products work  Develop a simple design specification to guide their thinking  Share and clarify ideas through discussion  Model their ideas using prototypes and pattern pieces  Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas  Use computer-aided design to develop and communicate their ideas  Generate innovative ideas, drawing on research  Make design decisions, taking account of constraints such as time, resources and cost | Surveys  Interview questionnaire web-based resource  Critically evaluate  Product  Annotate  Computer-aided design  Cross-section  Prototypes  Innovative  Constraints | Improve  Consolidate  Refine  Design  Efficiency  Effectiveness  Research  Critically evaluation  Purpose  Decision -making |
| **To take inspiration from design throughout history** |  | • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.  • Create innovative designs that improve upon existing products.  • Evaluate the design of products so as to suggest improvements to the user experience. | **Know:**  About inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products  How well products have been designed & made  Why materials have been chosen  What methods of construction have been used  How well products work  How well products achieve their purposes  How well products meet user needs and wants  Who designed and made the products  Where products were designed and made  When products were designed and made  Whether products can be recycled or reused  How much products cost to make  How innovative products are  How sustainable the materials in products are  What impact products have beyond their intended purpose (positive or negative) | Analysis  Investigation  Pioneer  Generate  Disassemble  User  Recycle  Reuse  Method | Analysis  Investigation  Purpose  Improve  Recycle  Reuse  Sustainability  Impact |