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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 sourceHow to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and bakingThat a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell plateThat to be active and healthy, food and drink are needed to provide energy for the bodyThat recipes can be adapted to change the appearance, taste, texture and aromaThat 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 bakingvariety and balanceappearance, taste, texture and aromatemperaturemethod | HealthSeasonality Balance Taste Nutrition Hygiene MeasurementAccuracy |
| 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 taskExplain their choice of tools and equipment in relation to the skills and techniques they will be usingSelect materials and components suitable for the taskExplain their choice of materials and components according to functional properties and aesthetic qualitiesProduce appropriate lists of tools, equipment and materials that they needFormulate step-by-step plans as a guide to makingFollow procedures for safety and hygieneUse a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical componentsAccurately measure, mark out, cut and shape materials and componentsAccurately assemble, join and combine materials and componentsAccurately apply a range of finishing techniques, including those from art and designUse techniques that involve a number of stepsDemonstrate resourcefulness when tackling practical problemsHow to use learning from science to help design and make products that workHow to use learning from mathematics to help design and make products that workThat materials have both functional properties and aesthetic qualitiesThat materials can be combined and mixed to create more useful characteristicsThat mechanical and electrical systems have an input, process and outputThe correct technical vocabulary for the projects they are undertakingHow mechanical systems such as cams or pulleys or gears create movementHow more complex electrical circuits and components can be used to create functional productsHow to program a computer to monitor changes in the environment and control their productsHow to reinforce and strengthen a 3D frameworkThat a 3D textiles product can be made from a combination of fabric shapesThat a recipe can be adapted by adding or substituting one or more ingredients | Componentprecision | SuitabilityQuality 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 decorationvisual 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. | MechanicalElectrical cams pulleys gearscomplex combine reinforce strengthen | MotionForceMechanicalElectrical Innovation Control Adaptation Strengthen 3-dimensionalUse/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 productsConsider the views of others, including intended users, to improve their workRefer to their design criteria as they design and make and use their design criteria to evaluate their completed productsCritically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and makeEvaluate their ideas and products against their original design specificationCarry out research, using surveys, interviews, questionnaires and web-based resourcesIdentify 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 usersExplain how particular parts of their products workDevelop a simple design specification to guide their thinkingShare and clarify ideas through discussionModel their ideas using prototypes and pattern piecesUse annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideasUse computer-aided design to develop and communicate their ideasGenerate innovative ideas, drawing on researchMake design decisions, taking account of constraints such as time, resources and cost | SurveysInterview questionnaire web-based resourceCritically evaluateProduct AnnotateComputer-aided designCross-sectionPrototypesInnovativeConstraints  | Improve Consolidate Refine Design EfficiencyEffectivenessResearch 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 productsHow well products have been designed & madeWhy materials have been chosenWhat methods of construction have been usedHow well products workHow well products achieve their purposesHow well products meet user needs and wantsWho designed and made the productsWhere products were designed and madeWhen products were designed and madeWhether products can be recycled or reusedHow much products cost to makeHow innovative products areHow sustainable the materials in products areWhat impact products have beyond their intended purpose (positive or negative) | AnalysisInvestigation PioneerGenerate Disassemble UserRecycle Reuse Method  | AnalysisInvestigationPurpose Improve Recycle Reuse Sustainability Impact  |