DESIGN & TECHNOLOGY ASSOCIATION

DESIGN AND TECHNOLOGY PROGRESSION FRAMEWORK

NC2014 PoS – Coded Objectives

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	Lower KS3	Upper KS3	Across KS3
DA - DESIGNING Understanding contexts, users and purposes	**DA 1** - develop detailed design specifications to guide their thinking **DA 2** - use research including the study of different cultures, to identify and understand user need **DA 3** - identify and solve their own design problems	**DA 4** - develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety **DA 5** - research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users **DA 6** - understand how to reformulate design problems given to them	**DA 7** - work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion **DA 8** - consider the influence of a range of lifestyle factors and consumer choices when designing products **DA 9** - take creative risks when making design decisions **DA10** - consider additional factors such as ergonomics, anthropometrics or dietary needs **DA 11** - analyse where human values may conflict and compromise has to be achieved
DB - DESIGNING Generating, developing, modelling and communicating ideas	**DB 1** - use 2D and begin to use 3D CAD packages to model their ideas **DB 2** - produce models of their ideas using CAM to test out their ideas	**DB 3** - use 3D CAD to model, develop and present their ideas **DB 4** - use CAD and related software packages to validate their designs in advance of manufacture	**DB 5** - use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations **DB 6** - combine ideas from a variety of sources **DB 7** - use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses **DB 8** - decide which design criteria clash and determine which should take priority **DB 9** - develop and communicate design ideas using annotated sketches **DB 10** - produce 3D models to develop and communicate ideas **DB 11** - use mathematical modelling to indicate likely performance before using physical materials and components, for instance when developing circuits or gearing systems **DB 12** - give oral and digital presentations and use computer-based tools

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MA - MAKING Planning	**MA 1** - produce ordered sequences and schedules for manufacturing products they design, detailing resources required **MA 2** - produce costings using spreadsheets for products they design and make	**MA 3** - create production schedules that inform their own and others' roles in the manufacturing of products they design **MA 4** - make simple use of planning tools, for instance Gantt charts **MA 5** - communicate their plans clearly so that others can implement them **MA 6** - match and select suitable materials considering their fitness for purpose	**MA 7** - select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture **MA 8** - select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness
MB - MAKING Practical skills and techniques	**MB 1** - make use of specialist equipment to mark out materials **MB 2** - use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives **MB 3** - use CAD/CAM to produce and apply surface finishing techniques, for example using dye sublimation **MB 4** - investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials e.g. dying and appliqué	**MB 5** - adapt their methods of manufacture to changing circumstances **MB 6** - recognise when it is necessary to develop a new skill or technique	**MB 7** - follow procedures for safety and hygiene and understand the process of risk assessment **MB 8** - use a wider, more complex range of materials, components and ingredients, taking into account their properties **MB 9** - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely **MB 10** - exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision **MB 11** - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods

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EA - EVALUATING Own ideas and products	**EA 1** - evaluate their products against their original specification and identify ways of improving them **EA 2** - actively involve others in the testing of their products	**EA 3** - select appropriate methods to evaluate their products in use and modify them to improve performance **EA 4** - produce short reports, making suggestions for improvements	**EA 5** - test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
EB - EVALUATING Existing products	**EB 1** - products through disassembly to determine how they are constructed and function **EB 2** - the positive and negative impact that products can have in the wider world	**EB 3** - products that they are less familiar with using themselves **EB 4** - products considering life cycle analysis **EB 5** - how products can be developed considering the concept of 'cradle to grave' **EB 6** - the concept of circular economy approaches in relation to product development and consumption	**EB 7** - new and emerging technologies
EC - EVALUATING Key events and individuals			**EC 1** - about an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their products to their own designing and making

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TK - TECHNICAL KNOWLEDGE Making products work	**TK 1** - how to classify materials by structure e.g. hard words, soft woods, ferrous and non-ferrous, thermoplastic and thermosetting plastics **TK 2** - about the physical properties of materials e.g. grain, brittleness, flexibility, elasticity, malleability and thermal **TK 3** - how more advanced electrical and electronic systems can be powered and used in their products **TK 4** - how to use simple electronic circuits incorporating inputs and outputs **TK 5** - about textile fibre sources e.g. natural and synthetic and fabrics e.g. plain and woven **TK 6** - how to select and modify patterns and use in textile construction	**TK 7** - how materials can be cast in moulds **TK 8** - how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines **TK 9** - how to apply computing and use electronics to embed intelligence in products that respond to inputs **TK 10** - make use of sensors to detect heat, light, sound and movement such as thermistors and light dependant resistors **TK 11** - how to apply the concepts of feedback in systems **TK 12** - how to control outputs such as actuators and motors **TK 13** - how to use software and hardware to develop programmes and transfer these to programmable components for example, microcontrollers **TK 14** - how to make use of microcontrollers in products they design and manufacture themselves **TK 15** - how to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor	**TK 16** - use learning from science to help design and make products that work **TK 17** - use learning from mathematics to help design and make products that work **TK 18** - understand the properties of materials, including smart materials, and how they can be used to advantage **TK 19** - understand the performance of structural elements to achieve functioning solutions **TK 20** - understand how more advanced mechanical systems used in their products enable changes in movement and force **TK 21** - how to competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment

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CNA - COOKING AND NUTRITION Where food comes from		**CNA 1** - how to compare the cost of food when planning to eat out or cook at home **CNA 2** - about the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour	**CNA 3** - that food is produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade **CNA 4** - that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion
CNB - COOKING AND NUTRITION Food preparation, cooking and nutrition	**CNB 1** - the importance of a healthy and varied diet as depicted in the Eatwell Guide and eight tips for healthy eating **CNB 2** - that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life **CNB 3** - how to taste and cook a broader range of ingredients and healthy recipes, accounting for a range of needs, wants and values **CNB 4** - how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging	**CNB 5** - the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight **CNB 6** - how to use nutrition information and allergy advice panels on food labels to help make informed food choices **CNB 7** - how to use a broader range of preparation techniques and methods when cooking, e.g. stir-frying, steaming, blending **CNB 8** - how to modify recipes and cook dishes that promote current healthy eating messages **CNB 9** - the principles of cleaning, preventing cross-contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot	**CNB 10** - how to store, prepare and cook food safely and hygienically **CNB 11** - how to use date-mark and storage instructions when storing and using food and drinks **CNB 12** - how to select and prepare ingredients **CNB 13** - how to use utensils and electrical equipment **CNB 14** - how to apply heat in different ways **CNB 15** - how to use taste, texture and smell to decide how to season dishes and combine ingredients **CNB 16** - how to adapt and use their own recipes **CNB 17** - how to cook a repertoire of predominantly savoury dishes to feed themselves and others a healthy and varied diet