

Design and Technology Progression Framework – NC2014 PoS – Coded Objectives

	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 Gant 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
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