

KS4 [*Food*] Curriculum Plan 2014-15

[10 hours taught per fortnight]

[AQA GCSE Specification]

[include exam board web link here]

Full details of the units:

Topic	Content summary
Designing Skills	<ul style="list-style-type: none">• be creative and innovative when designing;• design products to meet the needs of clients and consumers;• understand the design principles of form, function and fitness for purpose;• understand the role that designers and product developers have, and the impact and responsibility they have on and to society;• analyse and evaluate existing products, including those from professional designers;• develop and use design briefs and specifications for product development;• consider the conflicting demands that moral, cultural, economic, and social values and needs can make in the planning and in the designing of products;• consider environmental and sustainability issues in designing products;• consider health and safety in all its aspects;• anticipate and design for product maintenance where appropriate;• design for manufacturing in quantity and to be aware of current commercial/industrial processes;• generate design proposals against stated design criteria, and to modify their proposals in the light of on-going analysis, evaluation and product development;• Reflect critically when evaluating and modifying their design ideas and proposals in order to improve the products throughout inception and manufacture;• use, where appropriate, a range of graphic techniques and ICT (including digital media), including CAD, to generate, develop, model and communicate design proposals;• investigate and select appropriate materials/ ingredients and components; plan and organise activities which involve the use of materials/ingredients and components when developing or manufacturing;• devise and apply test procedures;• check the quality of their work at critical/key points during development, and to indicate ways of modifying and improving it when necessary;• communicate the design proposal in an appropriate manner;• be flexible and adaptable when designing;• test and evaluate the final design proposal against the design specification;• evaluate the work of other designers to inform their own practice;• the advantages of working collaboratively as a member of a design team;• understand the need to protect design ideas.•
Making Skills	<ul style="list-style-type: none">• select and use tools/equipment and processes to produce quality products;• consider the solution to technical problems in the design and manufacture process;• use tools and equipment safely with regard to themselves and others;• work accurately and efficiently in terms of time, materials/ingredients and components;• manufacture products applying quality control procedures;• have knowledge of Computer Aided Manufacture (CAM) and to use as appropriate;• ensure, through testing, modification and evaluation, that the quality of their products is suitable for intended users and devise modifications where necessary that would improve the outcome(s);• the advantages of working as part of a team when designing and making products.

Materials and components

Understand the functional properties of food

- investigate the functional properties of: starch, sugar, protein and fat
examine the use of: starch to thicken, gel; sugar to flavour, colour, aerate and caramelize; protein to aerate and coagulate; fats to shorten, emulsify;
- understand how different functional properties of foods/ingredients affect finished products and achieve desired outcomes through product appraisal, investigations and food preparation;
- investigate and understand: gelatinisation: sauce making, elasticity: bread making, shortening: pastry making, aeration: raising agents, cake making, emulsification: salad dressings, coagulation: setting of egg mixtures, flavouring: sweetening agents in desserts/ flavouring and herbs and spices in savoury products e.g. pasta, colouring: fats used in pastry making, setting: gelatine in mousses, fermentation: bread production;
- understand the terms: binding, bulking, coating, enrobing, enriching, finishing techniques, glazing, palatability, plasticity, sealing, shaping, tenderizing;

Understand the nutritional properties of food

- examine the nutritional properties of ingredients/ food products. An understanding of the nutritional characteristics of the main nutrients: proteins, fats, carbohydrates – sugars and starches, vitamins and minerals – Vitamins A, B, C and D, Calcium, Iron;
- have knowledge of nutritional advice. Interpret and apply current nutritional/healthy eating guidelines, e.g. apply the recommendations of the 'Eat well plate', 5 a day, high fibre (NSP);
- be able to apply the nutritional advice when analysing existing food products. Understand that diets with deficiencies or excesses of particular nutrients may lead to health related problems;
- investigate nutritional and dietary needs of different target groups: including vegetarians, diabetics, coeliacs, calorie controlled, those with nut allergies and lactose intolerance;

The effects of combining different ingredients and the interaction of foods during preparation and cooking

- select and combine foods/ingredients to achieve different textures, finishes, shapes, size and appearance;
- understand how the following food structures are formed: solutions, suspensions, emulsions, and gels. Through practical activities, develop different types of salad dressings, sauces and cold desserts;
- investigate, through product development, the use of different ingredients/quantities/methods of making;

The importance of appropriate proportions on the structure, shape and volume of mixtures

- demonstrate how accurate measurement, ratio and proportioning affect preparation, making and shaping of products to designated criteria to achieve acceptable outcomes;
- investigate the adaptation of amounts in mixtures: cakes, pastry, sauces, bread, biscuits;
- through experiment, investigation and product development understand the importance of using appropriate amounts and types of ingredients and processing techniques to meet designated criteria and tolerances;

The effects of acids and alkalis

- understand factors that enable food products to be developed to designated criteria: i.e. colour, texture, storage and product profile;
- evaluate products and assess how the working characteristics of acids and alkalis have affected the final product

Acids – the effect of vinegar on the texture of meringue; retention of colour in fruit salad, e.g. lemon juice, souring of milk, e.g. yogurt.

Alkali – the effect of corn flour on the texture of meringue; bicarbonate of soda in gingerbread;

	<p>Demonstrate competence in a range of practical food skills/methods/processes to produce quality outcomes</p> <ul style="list-style-type: none"> • match materials and processes to produce products with good organoleptic qualities that are finished/presented to a high standard; • apply a range of processing techniques to produce food products; • present food products with the consideration of the importance of: colour, texture, flavour, shape, temperature and time, users needs, finishing techniques; • through the making of products and meals, demonstrate a wide variety of cooking skills/ processes including: fruit/vegetable preparation: peeling, slicing, grating, chopping; meat/fish/eggs/dairy products and alternative proteins (myco-protein, tofu, TVP), through a range of appropriate cooking processes; cake/biscuit making: whisking, rubbing-in, melting, creaming; sauce making: roux, all-in-one, blended; pastry making: short crust, rough puff; layering: cold desserts, cheesecake, trifle, tiramisu; bread making; finishing techniques: glazing, icings, coatings, garnishes, piping, caramelisation.
<p>Design and market influences</p>	<p>Investigate the design opportunities</p> <ul style="list-style-type: none"> • use product analysis, compare a range of existing packaged products to determine how the types, proportions and functions of ingredients have contributed to a product's overall characteristics and its ability to meet a specific need; • identify physical, nutritional and sensory characteristics in existing products in order to develop design criteria and generate their own ideas; • find out customer views and preferences for a range of different products using an appropriate range of methods including ICT, e.g. interview, questionnaire, product appraisal; <p>Identify and use stages in the development of a food product prototype</p> <ul style="list-style-type: none"> • examine and analyse design briefs to identify the type of information required to generate design criteria and design ideas; • produce a concise summary of relevant research information taking into account prior knowledge; • produce a list of very general design criteria which reflect research and analysis; • using existing recipes, generate a wide range of ideas for food products which meet the design criteria. Present annotated ideas in an appropriate form e.g. drawings, pictures, descriptions, using ICT; • where appropriate, use nutritional analysis software to model ideas prior to making; • carry out product formulation using a range of ingredients, techniques, methods, finishes; • evaluate, test and refine ideas as necessary and through evaluation against the criteria, select an idea for development; • draw up a product specification; <p>Product prototype development</p> <ul style="list-style-type: none"> • identify ways in which a product could be developed; • carry out modification and reformulation by changing the type, ratio and proportions of ingredients to meet nutritional/sensory aspects of the specification; • work with small quantities to identify the impact of the functions of ingredients on an outcome; • use investigations and testing to trial different shapes, sizes, finishes to achieve a high quality outcome which meets the specification; • consider different storage methods (chilling, freezing, re-heating) wherever appropriate to identify the impact on the sensory, structural and aesthetic properties of an outcome; • demonstrate how availability of ingredients, equipment and processes can alter or determine an end product; • use a range of sensory testing methods to carry out rigorous sensory analysis at each stage of development (product profile tests, ranking and rating tests, difference tests). Identify the impact of each development against the product specification and on the product's acceptability; • produce a manufacturing specification which lists the information a manufacturer would need in order to produce the prototype in quantity; • understand why and identify where standard components would be used in the manufacture of the product; • produce a production plan for the prototype in a test kitchen identifying quality control checks;

	<p>Labelling, packaging, product information and codes of practice</p> <ul style="list-style-type: none"> • use current labelling requirements to read, understand and use information on packaging and food labels and apply these to their own products; • understand that legislation governs the statutory and non-statutory content and layout for food labels; • understand and demonstrate the requirements for conveying product information to the consumer including, where necessary, information about accompaniments; • use nutritional software to analyse the nutritional content of the final prototype; • understand the reasons why food may be packaged in different forms to extend shelf life;
<p>Processes and Manufacture</p>	<p>The use, need and effect of additives</p> <ul style="list-style-type: none"> • Understand the use of natural and artificial additives in food products: Preservatives, e.g. vinegar, concentrated lemon juice, salt, sugar Colourings, e.g. caramel, tartrazine, Flavourings, e.g. herbs and spices, vanilla, monosodium glutamate Emulsifiers, e.g. lecithin; <p>The impact and effect of using a range of different equipment to produce food items of quality and consistency</p> <ul style="list-style-type: none"> • Demonstrate safe and hygienic use of a range of hand, mechanical and electrical equipment to ensure quality, e.g. cutters for uniformity of biscuits, temperature probe, e.g. cooking of high risk foods, consistency of outcome, e.g. food processor for slicing vegetables reduce time and effort: e.g. hand blender for soup, dough hook for bread; • Apply knowledge and understanding to select the most appropriate equipment and healthier cooking methods for food outcomes: e.g. steamers for vegetables, microwave for retention of vitamins; • Match equipment to desired outcomes within the preparation of ingredients and the production of different mixtures such as cakes, pastries, breads, sauces, decorations, purees, etc; <p>Storage of Food and Food Products</p> <ul style="list-style-type: none"> • Understand the need for different types of equipment and temperatures for the storage of food including chilling (0–5 °C), freezing (-18 °C), re-heating (72 °C) and ambient conditions (room temperature); • Explain and understand the importance of critical storage temperatures; • Use and understand different ways of monitoring temperature: e.g. the purpose and use of temperature probes, thermometers; • Understand the reasons for changes which occur in ingredients and foods during their preparation and storage, e.g. investigate the effects of chilling and freezing on different foods; • Understand the need for and apply appropriate hygiene and safety procedures: to ensure safe food handling techniques at all stages from raw material to product/outcome; • Consider food safety and hygiene when purchasing, storing, preparing, cooking and serving food: cross contamination, use by date, best before date, high risk food, cross contamination, danger zone; • Understand the risks posed by physical, chemical and biological contamination, e.g. symptoms of food poisoning; • Have an awareness of the reasons why food may be packaged in different forms to extend shelf life, including the use of new technologies such as nanotechnology; <p>Manufacturing/Large Scale Production Requirements</p> <ul style="list-style-type: none"> • Understand different commercial methods of food production including: one off, batch, mass, continuous flow; • Show an understanding of how CAD and CAM can be used within food manufacturing; • Explore/examine how quality control checks are used to produce consistent food products; • Examine how control checks can prevent problems in food production. <p>Technological Developments</p> <ul style="list-style-type: none"> • Understand the advantages and disadvantages of Genetically Modified Foods to food producers and consumers; • Explore, understand and assess the impact of the use of modified starches and functional foods to food producers and consumers. • Have an awareness of how new technologies are used to produce new foods and ingredients, including nano foods and be aware of consumer concerns around these developments, including the views of the European Union.

