Skills

Designing

Pupils should be given opportunities to:

1. use given design briefs, and where appropriate, develop their own to clarify their ideas for products
2. identify and use appropriate sources of information to help generate and develop their ideas for products
3. be creative and innovative in their thinking when generating ideas for their products
4. identify and apply knowledge and understanding about technological, sustainability and health and safety issues to develop ideas for products that are achievable and practical
5. develop a specification/recipe for their product
6. explore, develop and communicate design ideas in a range of ways, including annotation, drawings and CAD, *e.g. clip art libraries, internet resources, scanners, digital cameras*
7. model and refine their design ideas in 3-D form or food prototyping where appropriate
8. evaluate, refine and modify their design ideas as they develop in relation to aesthetics, sensory requirements, healthy lifestyle, function, safety, reliability, properties of materials, ingredients, components, sustainability and cost
9. evaluate their final design ideas against their initial specification/recipe.

Making

Pupils should be given opportunities to:

1. develop the skills to select and work with a range of materials and ingredients to make products in a variety of contexts
2. use hand and machine tools/utensils, and a range of equipment and processes, to mix, shape, form and join materials and ingredients
3. be creative in finding alternative ways of making if the first attempt is not achievable
4. develop techniques to ensure consistency and accuracy including the use of CAM, *e.g. CAM software linked to a cutter/plotter, lathe, milling machine or sewing machine*

Range

Pupils should be given opportunities to develop their design and technology capability through:

- activities in which they investigate, analyse and evaluate products in order to acquire technological and health and safety knowledge and understanding that can be applied in their designing and making
- activities in which they learn about the responsible use of materials considering issues of sustainability
- reflecting on the work of designers, inventors, architects and chefs, including those from Wales
- activities in which they develop and practise particular skills and techniques that can be applied in their designing and making
- activities in which they design and make products, focusing on different contexts and materials.

They should be given opportunities to:

- be creative
- be innovative and enterprising
- work independently and in groups.

Taken together, these activities should cover a range of materials and components, including food, resistant materials, textiles, and include work with systems and control.

5. test and evaluate their product against their original specification/recipe

Food

6. use a broad range of skills, techniques and equipment, as well as standard recipes, to cook meals and products
7. plan and carry out a broad range of practical cooking tasks safely and hygienically
8. apply current healthy eating messages in relation to the nutritional needs of different groups in society and consider issues of sustainability in order to make informed choices when planning, preparing and cooking meals or products
9. classify food by commodity/group and understand the characteristics of a broad range of ingredients, including their nutritional, functional and sensory properties

Resistant materials and textiles

10. learn about the properties and characteristics of materials and apply this knowledge and understanding when designing and making products
11. undertake materials testing, to determine suitability for intended use
12. combine and process materials in order to create enhanced properties and desired aesthetic characteristics
13. understand that loads can cause material failures in structures by bending, twisting and stretching
14. be aware of current developments in materials technology, *e.g. 'smart' materials*
15. consider issues of sustainability when choosing and using materials

Systems and controls

16. learn about the properties and characteristics of electrical/electronic and mechanical components and apply this knowledge and understanding when designing and making products
17. interconnect mechanisms to achieve different kinds of movement in products
18. build electronic components into control systems within products
19. understand feedback in control systems
20. design and interconnect systems and sub-systems for application in products
21. build microprocessor and computer control systems into products.

Health and safety

Pupils should be taught how to use tools/utensils and equipment safely and to consider the hazards and risks in their activities. They should be able to follow instructions to control risk to themselves and others, *e.g. electrical tools/utensils, rotating machinery, sewing machines.* When designing and making, pupils should take account of user safety, *e.g. the build quality of products, how hygiene standards should be maintained in the production of a food product.*

They should be made aware of the impact on their health and safety of certain behaviour, *e.g. healthy eating.*