

## **Appendix B: Design and Technology Progression Framework**

One of the main thrusts of the new curriculum is the idea that much of children's design and technology activity should be based upon innovative problem solving and the manufacture of products that respond to the needs of a given user.

Steps indicated by New National Curriculum Programmes of Study or which represent an age appropriate interpretation of the requirements are shown in a regular font. *Statements additional to the programmes of study and added as part of 'school curriculum' are in italics.*

Possible projects for 2014 /15

### **Greece**

Can you make a healthy flat bread snack or salad?

Can you make an ancient Greek sandal for a man or woman?

Mazes/ children's game based on topic theme

Greek musical instruments

Investigate Ancient Greek technology (eg, wheelbarrow [levers generally], aqueduct, truss roof [strengthening with triangles], lighthouses, cranes and pulleys, hydraulics etc)

Boats (Archimedes principal) – can you make a boat to hold a given weight and make it move?

### **Journeys through space**

Solar system mobiles

Can you make a moon buggy to cross a particular terrain?

Textile work on Space theme – cushion/bag/logo design

Design a meal. What do astronauts eat?

Make a frame structure to support a rocket.

### **A foreign country**

Make a photo frame

Ethnic clothing for a figure, a bag, etc

Food preparation / packaging for food

Can you build a bridge structure from these materials to hold a given weight?

Make a package to transport a fragile item.

Make a sunshade / umbrella.

### **Useful websites for Design and Technology activities**

<http://www.tes.co.uk/article.aspx?storyCode=6071623>

A collection of practical activities for KS1 and KS2 on a range of themes (registration free to download items)

<http://www.primaryresources.co.uk/dandt/dandt3.htm#movement>

<http://www.teachingideas.co.uk/dt/contents.htm>

Activities on many D&T themes across all age groups

<http://www.nationalstemcentre.org.uk/elibrary>

Lots of links to age related D&T activities etc

[http://www.crackingideas.com/teachers/innovation\\_packs/](http://www.crackingideas.com/teachers/innovation_packs/)

Lesson plans on the theme of innovation

<http://www.tes.co.uk/teaching-resource/A-range-of-recipes-for-food-technology-lessons-6019481>

Link to a recipes, activities and video clips on food for KS1 and KS2

<http://www.tes.co.uk/article.aspx?storyCode=6067480>

Savoury and sweet recipes and cooking videos

<http://cookit.e2bn.org/recipes/#>

A wide range of printable recipes

Key stage	<u>Progression of skills in Designing</u>	<u>Progression of skills in Making</u>	<u>Progression of skills in Evaluating</u>
<b>KS1</b>	<p><b>Understanding context, users and purpose:</b></p> <ul style="list-style-type: none"> <li>• Work within a range of contexts (eg: imaginary, story, home, school, the environment, local community, industry etc)</li> <li>• State what products they are designing and making.</li> <li>• Say whether their products are for themselves or others.</li> <li>• Describe what their products are for.</li> <li>• Say how their products will work.</li> <li>• Say how they will make the product suitable for their intended users.</li> <li>• Use simple design criteria to help develop their ideas.</li> </ul> <p><b>Generating, developing, modelling and communicating ideas</b></p> <ul style="list-style-type: none"> <li>• Generate ideas by drawing on their own experiences.</li> <li>• Use knowledge of existing products to come up with ideas.</li> <li>• Develop and communicate ideas by talking and drawing.</li> <li>• Model ideas by exploring materials, components, and construction kits by making templates and mock-ups.</li> <li>• Use ICT to develop and communicate ideas.</li> <li>•</li> </ul>	<p><b>Planning / Practical skills and techniques:</b></p> <ul style="list-style-type: none"> <li>• Follow safety and hygiene procedures</li> <li>• Select and use a range of tools and equipment (including kits), <i>explaining their choices</i></li> <li>• Select from and use a range of materials and components according to their characteristics</li> <li>• Measure, mark out, cut and shape materials and components</li> <li>• Assemble and join materials</li> <li>• Use finishing techniques including those from art.</li> </ul> <ul style="list-style-type: none"> <li>• <i>Plan by suggesting what to do next.</i></li> </ul>	<p><b>Own ideas and products:</b></p> <ul style="list-style-type: none"> <li>• Talk about design ideas and what they are making</li> <li>• Make simple judgements about their products and ideas against design criteria</li> <li>• <i>Suggest how their products could be improved</i></li> </ul> <p><b>Existing products:</b></p> <ul style="list-style-type: none"> <li>• What products are</li> <li>• Who products are for</li> <li>• What products are for</li> <li>• How products work</li> <li>• How products are used</li> <li>• Where products might be used</li> <li>• What materials products are made from</li> <li>• What they like and dislike about products</li> </ul> <p><b>Key events and individuals:</b></p> <ul style="list-style-type: none"> <li>• No requirements at KS1</li> </ul>
<b>Lower KS2</b>	<p><b>Understanding context, users and purpose:</b></p> <ul style="list-style-type: none"> <li>• Work confidently within a range of contexts.</li> <li>• Describe the purpose of their product.</li> <li>• Explain design features that will appeal to users.</li> <li>• Explain how particular parts of their product work.</li> <li>• Gather information about the needs and wants of particular individuals and groups.</li> <li>• Develop their own design criteria and use them to inform their ideas.</li> </ul> <p><b>Generating, developing, modelling and communicating ideas</b></p> <ul style="list-style-type: none"> <li>• Share and clarify ideas through discussion.</li> <li>• Model their ideas through prototypes and pattern pieces.</li> <li>• Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas.</li> <li>• Use CAD to develop and communicate their ideas.</li> <li>• Generate realistic ideas based on the needs of the user.</li> <li>• <i>Make design decisions, taking account of the availability of resources.</i></li> </ul>	<p><b>Planning / Practical skills and techniques:</b></p> <ul style="list-style-type: none"> <li>• Follow procedures for safety and hygiene</li> <li>• Select and use tools and equipment suitable to the task <i>and explain their choices</i></li> <li>• Select from and use a wider range of materials and components suitable to the task</li> <li>• Measure, mark out, cut and shape materials and components with some accuracy.</li> <li>• Apply finishing techniques including those from art with some accuracy.</li> <li>• Explain their choices according to functional properties and/or aesthetic qualities</li> </ul> <ul style="list-style-type: none"> <li>• <i>Order the main stages of making</i></li> <li>• <i>Explain choices in relation to the skills and techniques used</i></li> </ul>	<p><b>Own ideas and products:</b></p> <ul style="list-style-type: none"> <li>• Identify the strengths and areas for development in their ideas and products</li> <li>• Consider the views of others, including intended users, to improve their work</li> <li>• Refer to their design criteria as they design and make</li> <li>• Use their design criteria to evaluate their completed products</li> </ul> <p><b>Existing products:</b></p> <p>Pupils should investigate and analyse:</p> <ul style="list-style-type: none"> <li>• How well products have been designed and made</li> <li>• Why materials have been chosen</li> <li>• What methods of construction have been used</li> <li>• How well product works and achieve their purpose</li> <li>• How well products meet the user's needs and wants</li> <li>• Who designed and made the products where products were designed and made</li> <li>• When products were designed and made</li> <li>• Whether products can be recycled or reused</li> </ul> <p><b>Key ideas and individuals:</b></p> <p>Pupils should know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products</p>

<p><b>Upper KS2</b></p>	<p><b>Understanding context, users and purpose:</b></p> <ul style="list-style-type: none"> <li>• Work confidently within a range of contexts.</li> <li>• Describe the purpose of their product.</li> <li>• Explain design features that will appeal to users.</li> <li>• Explain how particular parts of their product work.</li> <li>• Carry out research using surveys, interviews, questionnaires and web based resources.</li> <li>• Identify the needs, wants and preferences and values of particular individuals and groups.</li> <li>• <i>Develop a simple design specification to guide their thinking.</i></li> </ul> <p><b>Generating, developing, modelling and communicating ideas.</b></p> <ul style="list-style-type: none"> <li>• Share and clarify ideas through discussion.</li> <li>• Model their ideas through prototypes and pattern pieces.</li> <li>• Use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas.</li> <li>• Use CAD to develop and communicate their ideas.</li> <li>• Generate innovative ideas, drawing on research.</li> <li>• <i>Make design decisions, taking account of constraints such as time, resources and cost.</i></li> </ul> <p>See also Progression in skills for Design and Planning</p>	<p><b>Planning / Practical skills and techniques:</b></p> <ul style="list-style-type: none"> <li>• Work with accuracy throughout making process</li> <li>• Demonstrate resourcefulness when tackling problems.</li> <li>• <i>Use techniques that involve a number of steps.</i></li> <li>• <i>Produce appropriate lists of tools, equipment and materials they need</i></li> <li>• <i>Formulate step by step plans as a guide to making</i></li> </ul> <p>See also Progression in skills for: Textiles Structures Model making and materials</p>	<p><b>Own ideas and products:</b></p> <ul style="list-style-type: none"> <li>• Identify the strengths and areas for development in their ideas and products</li> <li>• Consider the views of others, including intended users, to improve their work</li> <li>• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make</li> <li>• <i>Evaluate their ideas and products against their original design specification</i></li> </ul> <p><b>Existing products:</b> Pupils should investigate and analyse:</p> <ul style="list-style-type: none"> <li>• How well products have been designed and made</li> <li>• Why materials have been chosen</li> <li>• What methods of construction have been used</li> <li>• How well product works and achieve their purpose</li> <li>• How well products meet the user's needs and wants</li> <li>• How much products cost to make</li> <li>• How innovative products are</li> <li>• How sustainable the materials in products are</li> <li>• What impact products have above their intended purpose</li> </ul> <p><b>Key ideas and individuals:</b> Pupils should know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products</p>
<p><b>Key stage</b></p>	<p><b><u>Progression of skills in Technical Knowledge</u></b></p>		<p><b><u>Progression of skills in Cooking and nutrition</u></b></p>
<p><b>KS1</b></p>	<p><b>Making products work</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• About the simple working characteristics of materials and components</li> <li>• About the movement of simple mechanisms such as levers, sliders, wheels and axles</li> <li>• How freestanding structures can be made stronger, stiffer and more stable</li> <li>• <i>That a 3D textile product can be made from two identical fabric shapes</i></li> <li>• <i>That food ingredients should be combined according to their sensory characteristics</i></li> <li>• <i>The correct technical vocabulary for the projects they are undertaking</i></li> </ul>	<p><b>Where food comes from</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• That all food comes from animals and plants</li> <li>• That food has to be farmed, grown elsewhere (eg at home) or caught</li> </ul> <p><b>Food preparation, cooking and nutrition</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• How to name and sort foods into the 5 groups on the 'Eatwell plate'</li> <li>• That everyone should eat at least 5 portions of fruit and vegetables every day</li> <li>• How to prepare simple dishes safely and hygienically without using a heat source</li> <li>• How to use techniques such as cutting, peeling and grating</li> </ul>	
<p><b>Lower KS2</b></p>	<p><b>Making products work</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• How to use learning from science and mathematics to help design and make products that work</li> <li>• That materials have both functional and aesthetic properties</li> <li>• <i>That materials can be combined and mixed to create more useful characteristics</i></li> <li>• That mechanical and electrical systems have an input, process and output</li> <li>• <i>The correct technical vocabulary for the products they are undertaking</i></li> <li>• How mechanical systems such as levers and linkages or pneumatic systems create movement</li> <li>• How simple electrical circuits and components can be used to create functional products</li> <li>• How to program a computer to help to control their products</li> <li>• How to make strong, stiff shell structures</li> <li>• <i>That a single fabric shape can be used to make a 3D textile product</i></li> <li>• <i>That food ingredients can be fresh, pre-cooked and processed</i></li> </ul>	<p><b>Where food comes from</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• That food is grown, reared and caught in the UK, Europe and the wider world</li> </ul> <p><b>Food preparation, cooking and nutrition</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• How to cook and prepare a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source</li> <li>• How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking</li> <li>• That a healthy diet is made up from a variety and balance of different food and drink, as depicted on the 'Eatwell plate'</li> <li>• That to be active and healthy, food and drink are needed to provide energy for the body</li> </ul>	

<p><b>Upper KS2</b></p>	<p><b>Making products work</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• How to use learning from science and mathematics to help design and make products that work</li> <li>• That materials have both functional and aesthetic properties</li> <li>• <i>That materials can be combined and mixed to create more useful characteristics</i></li> <li>• That mechanical and electrical systems have an input, process and output</li> <li>• <i>The correct technical vocabulary for the products they are undertaking</i></li> <li>• How mechanical systems such as cams or pulleys or gears create movement</li> <li>• How more complex electrical circuits and components can be used to make functional products</li> <li>• How to control a computer to monitor changes in the environment and to control their products</li> <li>• How to reinforce and strengthen a 3D framework</li> <li>• <i>That a 3D textile product can be made from a combination of fabric shapes</i></li> <li>• <i>That a recipe can be adapted by adding or substituting one or more ingredients</i></li> </ul>	<p><b>Where food comes from</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• That food is grown, reared and caught in the UK, Europe and the wider world</li> <li>• That seasons may affect the food available</li> <li>• How food is processed into ingredients that can be eaten or used in cooking</li> </ul> <p><b>Food preparation, cooking and nutrition</b> Pupils should know:</p> <ul style="list-style-type: none"> <li>• How to cook and prepare a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source</li> <li>• How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking</li> <li>• <i>That recipes can be adapted to change the appearance, taste, texture and aroma</i></li> <li>• That different food and drink contain different substances- nutrients, water and fibre – that are needed for health</li> </ul>
-----------------------------	--	---