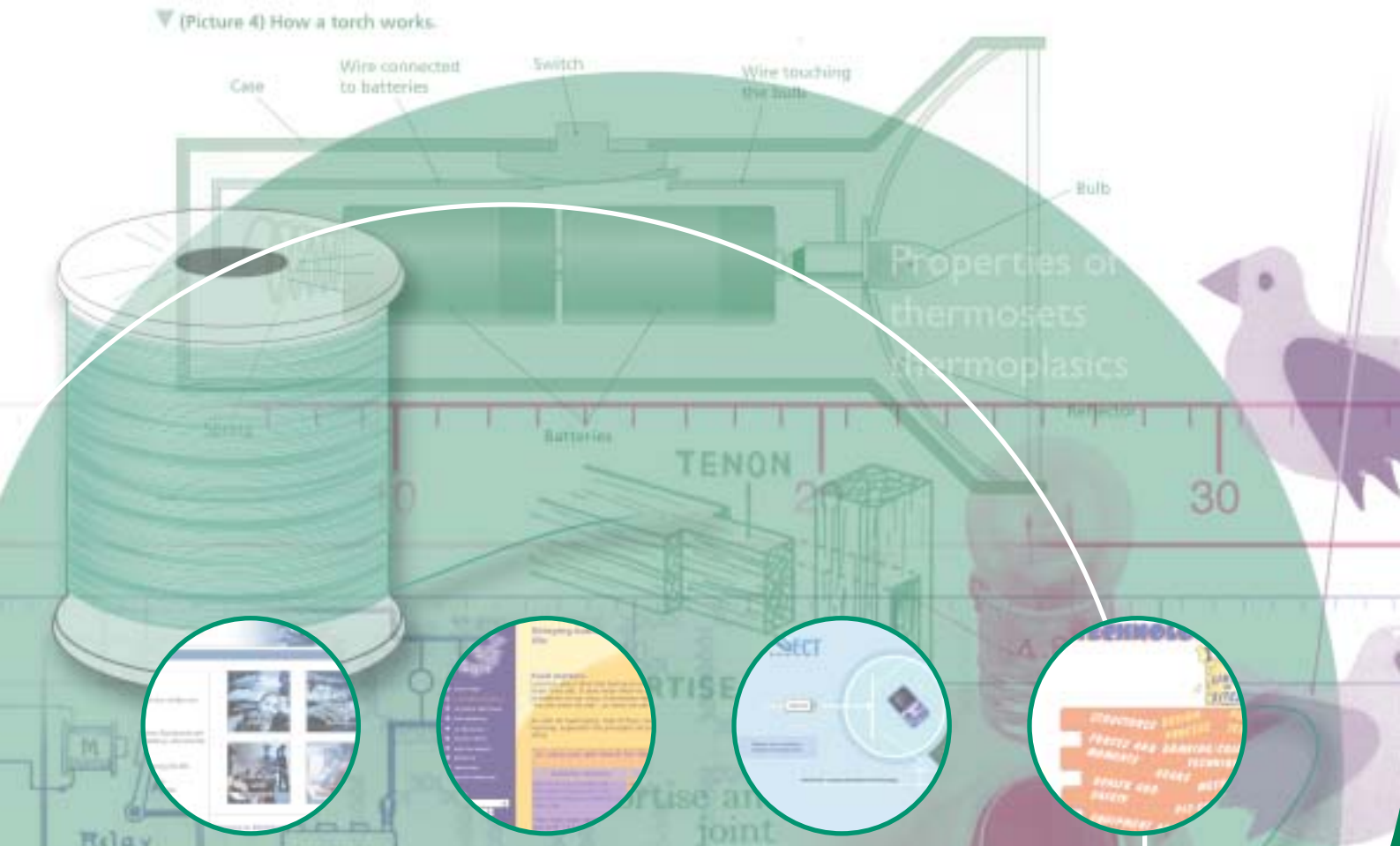
Becta
ICT Advice



Using **web-based resources** in Secondary Design & Technology

Using web-based resources in secondary design and technology

There are many uses of ICT that are appropriate within design and technology, among them an increasing number of web-based resources that can support and enhance learning in this area.

ICT can help pupils' learning in design and technology by:

- enhancing their capability to explore, develop, communicate and present their ideas
- providing a range of information sources to support their developing knowledge
- providing tools, equipment and components for designing, such as modelling
- contributing to a critical awareness of the impact of design and of technology on the world.

ICT can also be used to bring the outside world into the classroom, through photos, animation or video clips, thereby immersing pupils in real contexts, making things more concrete and better enabling them to visualise concepts.

The examples presented in this booklet highlight ways in which web-based resources may be used effectively to support pupils' learning within design and technology specifically at Key Stage 3, although many may also be appropriate at Key Stage 4. Equally, you will have your own ideas that are just as relevant. Only a selection of the QCA Key Stage 3 design and technology units of work are exemplified here, in order to provide a possible starting point from which you may then plan to use web-based resources more extensively.

Depending on your objectives, ICT may be used to support design and technology in one of a number of ways: by planning for a class to work in an ICT suite; by using PCs in (or adjacent to) the design and technology teaching area; or by using a data projection facility for teaching purposes in the design and technology room. Each of these approaches will be relevant to support your aims at different times across a key stage and in order to ensure a variety of teaching and learning styles. However, the priority is for ICT to be used as a resource to enrich and extend design and technology teaching and learning. Using ICT for its own sake, rather than as a means to this end, may result in ICT getting in the way of this or taking time away from it, which is counterproductive. For this reason it is important for design and technology teams to plan the curriculum together strategically, considering when, where and why use of ICT might be most appropriate.

http://www.ictadvice.org.uk/webbasedresources

When planning the design and technology curriculum and learning objectives, thought should be given to where specific examples of ICT could be incorporated and the units of work which lend themselves most appropriately to this. The best starting point for planning is the National Curriculum Programmes of Study, or your own learning objectives for units of work which will be based on these. At Key Stage 3, reference should also be made to the National Strategy framework where design and technology is grouped within the Foundation subjects. Principles from the framework are incorporated into the examples in this booklet. For instance, as well as being used throughout a lesson, web-based resources may effectively form the basis of lesson starter activities or plenary sessions where pupils demonstrate and display their work and reflect on what they have learnt.

Just as you would select appropriate design and technology activities for pupils, you also need to ensure that you select activities involving appropriate levels of ICT skills. If pupils are struggling with aspects of ICT this may hinder, rather than support, their learning in terms of design and technology. As a general rule, it is not appropriate to teach new ICT skills within design and technology lessons unless this is for the purpose of teaching a particular design and technology application, such as aspects of control, use of a graphics package or nutritional analysis software.

The role of the teacher in selecting, managing and using ICT with pupils is paramount in supporting quality teaching and learning in design and technology. The teacher's skills in demonstrating, explaining, posing questions, stimulating discussion and analysing information displayed are as important as the technology, if not more-so. As with any resource, it is important to set well-defined tasks when using web-based materials and to intervene appropriately in relation to the learning objectives and pupils' needs/abilities.

Whilst the development of design and technology knowledge, skills and capability remains the central purpose of the subject, the featured examples demonstrate how values and issues, citizenship and critical awareness of the impact of design and of technology on society may also be addressed in context.

All web addresses have been checked and were correct at time of printing.

Secondary Design and Technology

The introduction of projection technologies into schools provides an opportunity for ICT to make a direct impact on design and technology teaching. The teacher is enabled to present, model and explain information and pupils can benefit from interacting with technologies to share, develop and present ideas. The use of models allows pupils to change variables, investigate their impact and effects and simulate industrial practices that would be difficult to address in schools without ICT.

BSI Education

The British Standards Institute (BSI) provides a wide range of materials relevant to standards in manufacturing on its website. The site has teacher information and student sections relevant to resistant materials and electronics at Key Stage 3/4, Vocational GCSEs and A-level, and focuses on developing pupils' understanding by engaging them in standards-based work in their projects.

URL: **http://www.bsi-global.com/education/**

Additional sites:

Ergonomics 4 Schools: **http://ergonomics4schools.com/**

DTI: **http://www.dti.gov.uk/strd/cemark.html**

Technology Student.com: **http://www.technologystudent.com/health1/consafe1.htm**

Little Wonders Toy Shop: **http://www.littlewonders.co.uk/**

PeopleSize2000: **http://www.openerg.com/psz.htm**

Relevant to the following:

Scheme of Work
Unit 7B(ii) Designing and making for yourself
Unit 7C Using ICT to support researching and designing
Unit 8B (ii) Designing for client
Unit 9E (ii) Ensuring quality production

National Curriculum
1c, 1e, 1g, 2b, 3b, 6b

In a Year 7 project pupils were designing simple toys for young children based mainly on the use of wood, within design and technology Unit 7C, 'Using ICT to support researching and designing'. A key aim of the project was to develop pupils' ability to produce high-quality final products. This was partly related to precision in the use of hand and machine tools and the quality of finish, but the teacher also wanted to introduce the idea of safety as a dimension of final quality. To this end she provided safety testing resources for the pupils to use based on the testing described on the BSI website. She also provided pupils with the Product Testing record sheet from the site and asked them to keep a record of the tests they had employed.

As well as focusing on safety as a part of quality, the teacher asked the pupils to think about the factors that would make a wooden toy appropriate for a young child. This allowed her to introduce, at an appropriate level, the ideas of anthropometrics and ergonomics. She supported this by introducing materials from the Ergonomics 4 Schools website as a starter activity that pupils followed up for homework.

For a plenary, and as part of the evaluation of the products made, the class discussed whether their products should be eligible to carry the BSI kitemark and/or the CE logo.

Bad Human Factors Designs

This site provides an extensive list of artefacts that are, in different ways, badly designed. Each bad design has a description and an analysis as to why the design is considered bad. Each artefact also includes a suggestion for ways in which its design could be improved. The site also invites readers' comments and these may be added to the discussion of a particular bad design.

URL: **http://www.baddesigns.com/**

Additional sites:

Design Council: **http://www.designcouncil.org.uk**

Better by Design: **http://www.designcouncil.info/betterbydesign/**

Design Against Crime: **http://www.shu.ac.uk/schools/cs/cri/adrc/dac/home.html**

Relevant to the following:

Scheme of Work
Unit 7B (ii) Designing and making for yourself
Unit 8B (ii) Designing for clients
Unit 8F The world of professional designers
Unit 9B (ii) Designing for markets

National Curriculum
1c, 1e, 3a, 3c

As part of design and technology Unit 8B (i), 'Designing for clients', a Year 8 teacher wanted his pupils to think carefully about the needs of the users of the products they were designing and making. He started by asking them to think of products in their house that didn't work as well as expected and encouraged the class to focus particularly on ways in which better design could have solved the problems. He then introduced them to some examples from the Bad Designs website on a large screen and together they established a list of ideas that would help them avoid becoming bad designers. This was followed by a homework exercise to find something in their home that was badly designed and to suggest ways of improving it.

In subsequent lessons, to show pupils how designers ensure that their designs are good, the teacher used some of the millennium product case studies and design studies from the Design Council website. These worked well as quick starter activities and helped broaden the pupils' understandings of the ways in which professional designers work.

Throughout the rest of the unit the teacher maintained the focus on good design in a number of ways, including the use of case study materials from the Better by Design website (which supports the TV series) and the Design Against Crime website.

British Plastics Federation

This website has two sections that are particularly valuable to education: a database of information about the properties and commercial uses of a wide range of thermosets and thermoplastics, and a comprehensive section on plastic processing techniques that includes clear animations of the processes.

URL: **http://www.bpf.co.uk/**

Additional sites:

North Carolina State University: **http://courses.ncsu.edu/classes/ted430/intro.html**

Design inSite: **http://www.designinsite.dk/**

Materialise: **http://www.materialise.com/prototypingsolutions/**

Hands on Plastics: **http://www.handsonplastics.com/hands_on_plastics/**

Relevant to the following:

Scheme of Work
Unit 8E (ii) Producing batches
Unit 9B (ii) Designing for markets
Unit 9E (ii) Ensuring quality production

National Curriculum
1a, 2a, 2b, 2d, 4a, 4c, 4d

The teacher of a Year 9 class wanted to focus her teaching on the ways in which products are made in industry, with a particular focus on plastics, mass production and industrial processing methods, including rapid prototyping. The unit of work was based around pupils designing and making in quantity while maintaining quality – design and technology Unit 9E, 'Ensuring quality production'.

To develop their understanding of the properties and uses of a range of plastics and how they are processed, the teacher provided pupils with a list of resources, including the British Plastics Federation website. The sites were introduced to the class using an interactive whiteboard in order to develop awareness of the scope of material available. Then, in pairs, pupils were given tightly focused topics and asked to make a short presentation about their topic to the rest of the class. These were based on the information available in both printed resources and on the web. They were used as lesson starters during the first few weeks of the unit of work.

British Nutrition Foundation

This website is an excellent source of information, popular with teachers and pupils. In addition to reliable nutrition information, it provides guidance, case studies and downloadable resources to support teaching and learning in nutrition, diet and food.

URL: **http://www.nutrition.org.uk**

Additional sites:

Food Forum (Covent Garden Soups): **http://www.foodforum.org.uk/ffiles/New_Covent_Garden_Soups-Mat+Inn+Pro+Man-KS4+Post.shtml**

Covent Garden Soups: **http://www.coventgardensoup.co.uk/home.htm**

Sainsbury: **http://www.j-sainsbury.co.uk/education/tasteofsuccess/secondary.htm**

Food Standards Agency (fruit and veg): **http://www.food.gov.uk/healthiereating/dailydiet/fruitandveg/**

FSA Wales: **http://www.food.gov.uk/wales/intergameswales**

Relevant to the following:

Scheme of Work
Unit 7A (i) Understanding materials
Unit 9B (i) Designing for markets
Unit 9E (i) Ensuring quality production

National Curriculum
1c, 1d, 1f, 2b, 2c, 3b, 3c, 4a, 4b, 4c

As part of a unit of work on healthier eating and linked to the design and make assignment in design and technology Unit 7A (i), 'Understanding materials', pupils were learning about the importance of including at least five portions of fruit and vegetables in their daily diet. The teacher made use of a number of downloadable Balance of Good Health resources on the British Nutrition Foundation site to support her teaching about the importance of fruits and vegetables in the diet.

Pupils then worked in groups of four to make and evaluate a number of existing soups – canned, fresh and home-made types from basic recipes. An attribute analysis template from the British Nutrition Foundation site was downloaded in advance by the teacher and the class reached agreement on the sensory attributes for which they would test the soups. Each group made the soup samples, carried out a taste test and entered their group's ratings for each product sample into the attribute analysis spreadsheet. This was projected on the large screen and the teacher showed the class how to turn their data into a star diagram presenting the results of each group plus the overall class response.

Following this practical experience, pupils were set the task of selecting different vegetable combinations with which to produce a soup of their own for a season and age group of their choice. For homework, to support the generation and development of their own ideas, pupils looked at the products and recipes on the Covent Garden Soup site, and the case study information on Food Forum and the Sainsbury site.

The teacher concluded the unit with a quick healthy eating game from the FSA Wales website. This was projected on the large screen as a way of recapping key teaching points.

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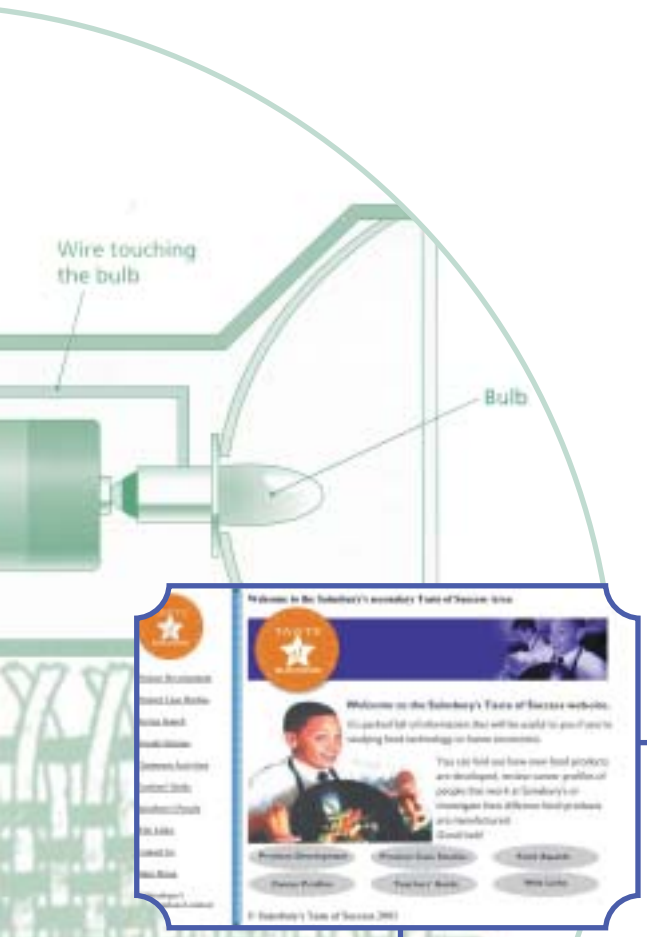


Taste of Success

The Sainsbury's Taste of Success website is a useful resource to use for teaching about industrial and commercial realities in the food context, as well as to help pupils to relate this to their own designing and making.

URL: **http://www.j-sainsbury.co.uk/education/tasteofsuccess/secondary.htm**

Additional sites:

British Nutrition Foundation: **http://www.nutrition.org.uk**

Food Forum (worksheets): **http://www.foodforum.org.uk/curriculum/Worksheets.shtml**

Food Forum (unit operations): **http://www.foodforum.org.uk/ffiles/Unit_Operations-Inn+Mat+Man+Pro+Sys-Post.shtml**

Food Forum (new product development): **http://www.foodforum.org.uk/ffiles/New_Product_Development_2-Inn+Pro+Man+Con-KS4+Post.shtml**

Technology Insight: **http://www.technology.org.uk/indust.htm**

Relevant to the following:

Scheme of Work
Unit 8A (i) Exploring materials

Unit 8F The world of professional designers

Unit 9E (i) Ensuring quality production

National Curriculum
1a, 1b, 1f, 1g, 2b, 2c, 3c, 4a, 4c, 5b

A food technology teacher had selected the design and make assignment from design and technology Unit 8A(i), 'Exploring Materials', when teaching a Year 8 class about the numerous ways in which sauces may be combined with other ingredients into main course meals.

By way of introduction the class was asked to identify everyday dishes that incorporated sauces. The teacher went on to demonstrate different sauce-making processes whilst covering teaching points about the functions of ingredients, and the setting and thickening of sauces. This was illustrated with information about food functions from the British Nutrition Foundation projected on the large screen. In addition, the role of modified starches as smart foods was outlined using information on smart foods from the same site and pupils analysed a number of ready-meal packages, identifying where modified starch was used and why.

Pupils worked in groups to make up small batches of different sauce types and then developed ideas for how they could be incorporated into dishes. They were provided with worksheets downloaded by the teacher from Food Forum and used these to create a record of their product development work, including ingredients used and the function they performed.

In the subsequent lesson, for which an ICT room had been booked, pupils worked in pairs and used case study information on the Food Forum and Sainsbury websites. They were asked to produce a flow diagram to show how their product would be mass produced by the chilling process and a short report on the effect of chilling on taste, texture, appearance, aroma, shelf life and nutritional value.

The teacher selected two or three pairs to present their flow diagram to the class. These were discussed and evaluated by way of a plenary session to this lesson.

FoodForum

In its f-files section the FoodForum website provides case studies on a range of food product, design and manufacture topics, related pupil activities and references to other useful web-based resources. This case study shows how to get the best out of a number of websites. In particular, materials that support an understanding of volume production have been chosen.

URL: Food Forum (bringing baking to life): **http://www.foodforum.org.uk/curriculum/Baking_Teacher_Guidance.shtml**

Additional sites:

Warburtons: **http://www.warburtons.co.uk**

Wrights Flour: **http://www.wrightsflour.co.uk**

Flour Advisory Bureau: **http://www.fabflour.co.uk**

Sainsbury: **http://www.j-sainsbury.co.uk/education/tasteofsuccess/secondary/casestudies.htm**

British Nutrition Foundation: **http://www.nutrition.org.uk**

Relevant to the following:

Scheme of Work
Unit 9E (i) Ensuring Quality Production
Unit 8F The world of professional designers
Unit 9C Using ICT to link to the world outside school

National Curriculum
1a, 1b, 1d, 1e, 1f, 2a, 2b, 2d, 3a,3c, 4a, 4b, 4c, 4d, 5a, 5b

A food technology teacher had selected the design and make assignment from design and technology Unit 9E(i), 'Ensuring Quality Production', to teach a Year 9 class about primary and secondary processing through the topic of flour and bread.

He introduced the unit with a practical activity using bread mixes, supported with a downloaded worksheet from Food Forum.

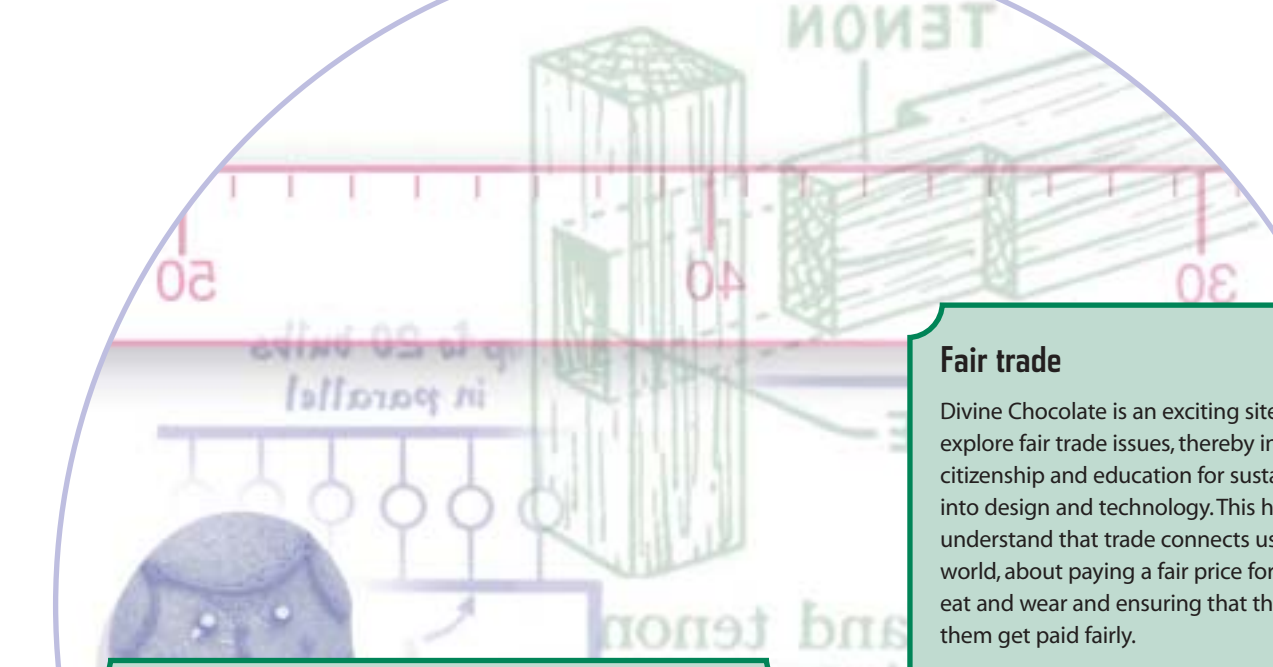
He then used the case study on Wright's bread mixes on the same site to explore how flour is milled and how bread mixes are produced, as a way of illustrating primary and secondary food processing.

To supplement a class tasting activity of the different breads made, the teacher used the 'Our products' section of the Warburtons site to project images of a range of different bread types from which to develop ideas. The photographic storyboard in the educational section of this site was used to demonstrate how bread is made on an industrial scale. This was projected on the whiteboard at the same time as the teacher demonstrated the process of making bread so that pupils could relate the two.

Pupils then worked in teams of four to develop and manufacture a bread product that would appeal to young people. They considered type, shape, size, flavouring and finish when developing a specification that would meet the needs and preferences of this target group. The web-based recipe database on the Wrights site was used for inspiration.

Pupils were then directed to the Sainsbury site and used the manufacturing images there to explore the commercial manufacture of bread and to produce a story board summarising the main stages of the process. Further research on bread production was carried out using other sites with each member of the group visiting one of these sites for homework and pooling their research findings with their peers.

Having researched production methods, pupils trialled their own bread production system. One member of the team acted as Quality Assurance Manager, monitoring system efficiency and product quality throughout. They took digital photographs to record key stages of the production system which helped with evaluation.



As part of a series of activities planned by a school for design and technology week (which takes place annually in June) a Year 8 class were set a number of focused tasks about where different materials come from, and where and how they are produced. Chocolate was taken as an example, and the Divine and Dubble chocolate sites were used to find out about fair trade chocolate. Pupils used the 'From Bean to Bar' pages to explore production and processing and to find out how chocolate is made. They produced their own storyboard by cutting and pasting photos from the site.

To help pupils to understand the process of chocolate manufacture, the teacher demonstrated how chocolate is tempered and the pupils produced chocolate novelty shapes, producing moulds for these in resistant materials where they considered the impact of packaging on the environment.

The STEP, Design Council and Fairtrade Foundation sites were used by some pupils to explore sustainability issues further and to provide them with a broader range of products to evaluate from the sustainability perspective.

With the graphics teacher working in tandem, pupils evaluated the existing designs in the Dubble packaging wrapper gallery and designed their own wrappers for their novelties which would encourage people to choose fair trade products. The teacher returned to fair trade issues in subsequent units of work where pupils were encouraged to use their knowledge to consider the broader impact of their designs.

Fair trade

Divine Chocolate is an exciting site from which to explore fair trade issues, thereby incorporating aspects of citizenship and education for sustainable development into design and technology. This helps children to understand that trade connects us to people around the world, about paying a fair price for the products we use, eat and wear and ensuring that the people who produce them get paid fairly.

URLs:

Divine Chocolate: **http://www.divinechocolate.com**

Dubble: **http://www.dubble.co.uk**

Soil Association: **http://www.soilassociation.org/web/sa/saweb.nsf/farmtrails**

STEP: **http://www.stepin.org**

Design Council: **http://www.designcouncil.org.uk**

Fairtrade Foundation: **http://www.fairtrade.org.uk**

Relevant to the following:

Scheme of Work
Unit 7C Using ICT to support researching and designing
Unit 7E Activity week
Unit 8F The world of professional designers
Unit 9C Using ICT to link to the world outside school

National Curriculum
1a, 1b, 1c, 1d, 2d, 3c, 4a, 4d

Having opportunities to discuss ideas with others and to test out different options and viewpoints is important to the development of creativity and thinking skills. If you have access to a large screen and LCD projector or interactive whiteboard, ICT can be used as a whole-class resource and provide this shared experience for pupils.

ECT Marconi

This site supports the Marconi ECT (Electronics and Communications Technologies) initiative. The site contains a wide range of materials, mostly aimed at teachers, designed to extend the teaching and learning of electronics in secondary schools. This material ranges from the technical (for example, component datasheets) to the pedagogic (such as how to manage resources and teaching and learning styles).

URL: **http://www.marconiect.org**

Additional sites:

Tech it out UK: **http://www.techitoutuk.com/tio8/knowledge/electronics/**

MadLab: **http://www.madlab.org/electrnx/lesson6.html**

Transtronics: **http://xtronics.com/kits/rcode.htm**

Technology Student.com: **http://www.technologystudent.com/elec1/ldr1.htm**

Relevant to the following:

Scheme of Work

Unit 7D Using control to control a display
Unit 8D Using control for security
Unit 9D Using control for electronic monitoring

National Curriculum

1a, 1c, 1d, 2b, 5a, 5d

Although he had little experience in electronics, the teacher of a Year 7 class wanted to develop an introductory electronics project based around a point-of-sale display – design and technology Unit 7D, 'Using control to control a display'. The materials on the Marconi website helped him to develop a scheme of work that was at an appropriate level for pupils. In particular, the site showed him how pupils could be allowed to make their own design decisions about elements of the electronics without the process becoming unmanageable for him.

When launching the electronics element of the work, the teacher introduced pupils to a limited number of resources, including websites, that contain information about input and output components since it was in these parts of the circuit that the teacher wanted to encourage pupil choice. Pupils were asked to review the information on these sites in the light of decisions they had made about the ways that they wanted their displays to operate and to select appropriate components. Before proceeding, the teacher required them to justify their choices of components based on the information they had gathered.

Young Embroiderers

From the Young Embroiderers site pupils can access information which is constantly updated on weaving, embroidery, knitting, felt making, dyeing, braiding, printing, and so on. There are instructions on techniques and inspiring pieces of work from others.

URL: **http://www.hiraeth.com/ytg**

Additional sites:

Bad Fads Museum: **http://www.badfads.com**

Relevant to the following:

Scheme of Work

Unit 7A (iii) Understanding materials
Unit 8C Using ICT to support making
Unit 8A (iii) Understanding materials
Unit 7B(iii) Designing and making for yourself

National Curriculum

2b, 2c, 2e, 3b, 4a, 4c

Year 8 pupils were working on a design and make assignment on the theme of design and technology Unit 8A (iii), 'Understanding materials – Finding an identity: decorative techniques on textiles', and were designing and printing a piece of fabric to make into a product that an environmental group could sell to its members. They were learning how to identify suitable materials and techniques, taking into account appearance, function, safety and reliability.

The teacher set up a range of workshops to show the pupils different decorative techniques including printing, resist techniques and embroidery. Pupils made small samples of each and annotated these with notes on how to make it, and the history and traditions associated with it using the Young Embroiderers site. The teacher also showed the class the Bad Fads Museum as a fun site to gain information about where trends such as tie-dye T-shirts have emerged from.

Pupils recorded some initial ideas and selected the most suitable technique for producing their piece of fabric. Pupils were each asked to suggest three ways that they could produce their piece of fabric (embroidery, fabric pens, block printing or screen printing, for example). To help them choose they used the 'projects' and 'links' sections to find out about how other designers had used these methods. They studied the examples, listed the advantages and disadvantages of using each technique for their particular project and presented the information as a chart which helped them to make their final choice.

Secondary Design and

SOFTswitch

From the SOFTswitch website pupils can access information about electronic fabrics and case studies about the applications in wearable electronics, smart interiors, pressure sensing, computing and games interfaces, toys and music.

URL: **http://www.softswitch.co.uk**

Additional sites:

Cyberglow: **http://www.cyberglow.co.uk/**

Advanced Safety Products: **http://www.advancedsafetyproducts.co.uk**

Relevant to the following:

Scheme of Work
Unit 7A (iii) Understanding materials
Unit 7B (iii) Designing and making for yourself
Unit 9A (iii) Selecting materials

National Curriculum
1a, 1b, 1c, 1d, 2b, 2c, 2e, 3a, 3b, 3c, 4a, 5a, 5e

A Year 7 class were working on the design and make assignment for Unit 7A (iii), 'Understanding Materials'. They were designing and making a safety garment or accessory to wear when walking, jogging or cycling. This involved them learning to use materials appropriately to meet a specific technical purpose.

In a previous lesson, they had examined a range of existing safety products, such as protective clothing and safety accessories. They discussed what materials they were made from and why these materials were chosen by the manufacturer. They evaluated the product's fitness for purpose, including its aesthetic appeal.

For homework, pupils researched other forms of protective clothing for specific activities and investigated safety finishes applied to fabrics, and fluorescent and reflective materials. Each group put together a scrapbook or mini display of pictures of high-visibility clothing, and annotated key design features. The teacher supported this homework by referring the pupils to the Cyberglow and Advanced Safety Products websites to collect their information.

As a related product evaluation task, and to help pupils with generating more innovative ideas, the teacher set a task using the SOFTswitch site. This helped her to present the concept of electronic fabrics and how this technology works in principle.

Pupils were divided into five groups and each was asked to look at a different case study of an application of SOFTswitch such as: wearable electronics, smart interiors, pressure sensing, computing and games interfaces, toys and music. The teacher focused the pupils by getting them to answer the following questions and reporting back to the group:

- *What do these terms mean? … wearable electronics, smart interiors, pressure sensing, computing and games interfaces.*
- *How does the technology work?*
- *Give examples of five products that use this technology.*
- *Has this given you any ideas that you could use when designing your product?*

Technology

Sustainable Technology Project

From the Sustainable Technology Education Project site pupils can access interactive resources about clothing for a sustainable future. It contains information and activities to help pupils understand the processes used for designing and producing textiles, the impact of these processes on the environment and how this impact could be reduced in the future.

URL: **http://www.stepin.org/menuframe.asp**

Additional sites:

FabricLink: **http://www.fabriclink.com**

Relevant to the following:

Scheme of Work

Units 9A (iii) Selecting materials

National Curriculum

A Year 9 class were working on a design and make assignment on the theme of sustainability within design technology Unit 9A (iii), 'Selecting materials'.

The teacher introduced pupils to 'smart' fabrics and discussed with them how materials are developed to meet special performance requirements and whether they are sustainable. Pupils then worked in groups with specific product information and labels such as gloves, jackets, waterproofs and rucksacks, to evaluate existing products. They compared how different examples of the same product are intended to meet similar needs. Pupils listed questions on the board that users might want to ask about products, then rephrased these so they became criteria. They used the FabricLink site [**www.fabriclink.com**] to check the meaning of technical terms used (such as Thermofil and Thinsulate) and presented their findings as a display to the class.

The teacher used the case study 'Recycled Fleeces' on the STEP site [**http://www.stepin.org/menuframe.asp**] to help pupils to explore the context and issues such as:

- design
- production
- product analysis
- whether it is sustainable

During the stage where pupils were evaluating a number of potential design ideas and developing their ideas further, they considered the wider implications of choosing a particular way of meeting the need or a particular fabric. The teacher downloaded the activities from the site as PDF files. There are four short, focused activities that tackle different aspects of sustainability:

- Is it sustainable?
- Is it appropriate?
- Winners and losers
- Got the message?

In groups the pupils used them to initiate questions and issues for future discussions:

- *What happens to the product after use?*
- *How long will it last?*
- *How easily can it be recycled?*
- *Who will pay for the recycling?*
- *What materials are used and why?*
- *Where do the materials come from?*
- *Are the resources likely to run out?*
- *Is there a problem with side effects, such as pollution?*
- *Who will benefit form this product?*

Technology Student

Designed specifically to support teachers of design and technology and their pupils, this covers a wide range of design and technology topics. These include work on Health & Safety and a discussion of the environmental impact of design and technology, as well as more technical resources such as structures, mechanisms, electronics and control.

URL: **http://www.technologystudent.com**

Additional sites:

Design and Tech.com: **http://www.designandtech.com/**

How Stuff Works: **http://electronics.howstuffworks.com/microcontroller.htm**

Revolution Education: **http://www.rev-ed.co.uk/**

Marconi ECT: **http://www.marconiect.org**

TEP: **http://www.tep.org.uk/**

Economatics: **http://www.economatics.co.uk/education/**

Relevant to the following:

Scheme of Work
Unit 8D Using control for security
Unit 9D Using control for electronic monitoring

National Curriculum
1a, 1g, 2d, 3c, 5b, 5d, 5e, 5f, 5g

A Year 9 class was asked to design an effective and attractive electronic product that could be used to care for someone or something – design and technology Unit 9D, 'Using control for electronic monitoring'. The teacher's aim was to bring together pupils' knowledge and understanding of a range of technologies and allow them to demonstrate their full capability. Pupils were given wide scope to determine the details of their project within the broad context of care. The only proviso was that the final solution should be centred on a PIC microcontroller.

A wide range of products emerged from this broad brief. One of the teacher's strategies for supporting this diversity was to use a range of design and technology student websites as supporting resources alongside a range of written materials. The Technology Student website was chosen because it is particularly good at helping pupils revisit some topics met in earlier years and it has support for the programming of PIC chips.

To set the scene, the teacher used the case study on electronics in health care from the ECT Marconi website to develop pupils' understanding of the wide range of contexts that 'care' encompasses. Pupils were also given a research sheet on microcontrollers and directed to various websites, including How Stuff Works, to carry out the research as homework.

During the PIC circuit development work, some pupils went beyond the basic PIC circuit design provided by the teacher, making use of resources provided by a number of manufacturers of PIC programming equipment.

Further practical suggestions and guidance to support teaching of the design and technology curriculum can be found on the following websites:

ICT Advice: **http://www.ictadvice.org.uk**
CAD in Schools: **http://www.cadinschools.org/home/**
DATA: **http://www.data.org.uk**
Food Technology: **http://www.foodtech.org.uk/**
DfES: **http://www.standards.dfes.gov.uk/**
Dyson: **http://www.dyson.co.uk/education**
Electronics in Schools: **http://www.electronicsinschools.com**
Indigo: **http://www.indigo-visions.co.uk**
Industry Council for Packaging & the Environment: **http://www.incpen.org**
Kent Education: **http://www.kented.org.uk/ngfl**
Living Smarter: **http://www.living-smarter.org**
NAAIDT: **http://www.dtonline.org**
NC Action: **http://www.ncaction.org.uk**
Virtual Teacher Centre: **http://vtc.ngfl.gov.uk/**
Nuffield design and technology: **http://www.secondarydandt.org/**
O2 sustainable design network: **http://www.o2.org**
QCA: **http://www.qca.org.uk**
Sustainable Technology Education Project: **http://www.stepin.org**

All URLs were correct at the time of printing but may be subject to change.
For enquiries relating to this booklet, please email: ictadvice@becta.org.uk

Secondary Design & Technology

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Becta
British Educational Communications and Technology Agency

Millburn Hill Road
Science Park
Coventry CV4 7JJ

Tel: 024 7641 6994
Fax: 024 7641 1418
Email: becta@becta.org.uk
URL: http://www.becta.org.uk