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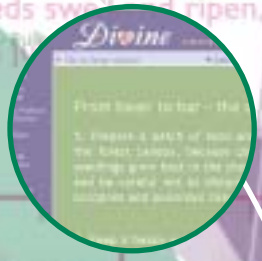

Using **web-based resources** in Primary Design & Technology

Using web-based resources in Design and Technology lessons

There are many uses of ICT that are appropriate with design and technology (D&T), and there is an increasing number of web-based resources that can support and enhance learning in this area.

ICT can help children's learning in design and technology by enhancing their capability to explore, plan, develop and communicate their ideas; providing a range of information sources to support their developing knowledge and understanding; providing tools, equipment and components for designing and making, for example, modelling; and contributing to participation in tomorrow's rapidly changing technologies.

The examples presented here highlight ways in which web-based resources may be used effectively to support children's learning within design and technology during Key Stages 1 and 2. Equally, you will have your own ideas, and other resources, that are just as relevant. Only a selection of the QCA design and technology units of work are exemplified here, in order to suggest starting points from which to use web-based resources more extensively. Some of the examples demonstrate ways in which focused practical tasks within specifically named design and technology units may be supported and enhanced by web-based resources. Others exemplify how practical tasks of a more generic nature could form part of any of the design and technology units. Some of the processes could also be used in investigating and evaluating activities or design and make assignments.

LEGO

From the LEGO site children can access the LEGO club, games and activities pages.

URL: **http://www.lego.com/eng/create/activities**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 1B, 2A, 2C, 3C, 6C, 6D

National Curriculum KS1 DT2d, 2e, 4a, 4b, 5a, 5b,

National Curriculum KS2 DT1a, 1c, 2e, 3b, 3c, 4b, 4c, 4d, 5a, 5b

Image courtesy of the LEGO Group, copyright 2004 The LEGO Group

A Year 2 class were designing and making a wheeled vehicle (D&T Unit 2A). They had already examined a number of pictures and construction models of vehicles provided by the teacher and considered the loads they could carry. They examined and identified different vehicle parts, used materials and components to realise their ideas, and then produced drawings of their vehicle and labelled the wheels, axles, chassis, body and cab.

As a related focused practical task, and to provide a chance to practise generic modelling skills through the medium of ICT, children were set the task of using the LEGO 'World Builder' section of the site to design buggies. They were encouraged to practise their skills of ordering, sequencing and problem solving by being given access to a LEGO kit to use alongside their PC.

Some children also used the 'Inventor Saves The Day' section of the site to apply their newly acquired knowledge about gears, axles and motors to invent a contraption incorporating these components.

Having been introduced to the LEGO site in Key Stage 1, children in this school are given regular opportunities to visit the site and use it more extensively. Older pupils use the 'Design School' section on the site which provides 'master classes' to help children become better designers and makers with LEGO. They use tips from other designers and post some of their own on the website.

Web-based resources can also bring the outside world into the classroom. For example, using photos, animation and video clips helps pupils to visualise concepts, particularly dynamic processes such as manufacturing.

While there are an extensive number of websites that can support design and technology, it is often better to use a small number of well-chosen sites that support specific learning objectives. ICT should be used as a resource to enhance, enrich and extend 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 learning.

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

The introduction of projection technologies into schools provides an opportunity for ICT to make a direct impact on primary classroom teaching. A projector or interactive whiteboard enables teachers to present, model and explain information, and children can benefit from interacting with technologies to share, develop and present their ideas.

It is important to the development of creativity and thinking skills for children to have opportunities to discuss ideas with others and to test out different options and viewpoints. 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 children.

In the Design Studio

The 'Design Studio' web pages of the GridClub website provide ideas and information to support children's designing and making across a number of contexts. Instructions for making products include: mechanisms, mini-greenhouse with timer to remind when plants need watering, masks, kites, jewellery, savoury snacks, food as gifts, greetings cards, containers, puppets and clothing.

URL: **http://www.gridclub.com/games/dt/designstudio/index.shtml**

Additional sites for research:

Puppet Patterns: **http://www.puppetpatterns.com**

Puppetry Workshop (Theatrix): **http://theatrix.freeyellow.com/312construction.html**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 1A, 2A, 2B, 3B, 3A, 3D, 4A

National Curriculum KS1 DT1a, 1b, 1c, 1d, 2a, 2d, 3a, 4a

National Curriculum KS2 DT1a, 1c, 2a, 2d, 3c, 4b

The role of the teacher in selecting, managing and using any resources (including ICT) with children 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 is as important when using technology as any other resource. In the same way, it is important to set well-defined tasks when using web-based materials, and to intervene appropriately in relation to the learning objectives and children's needs/abilities.

Whilst the development of design and technology capability is the focus of the examples featured here, they also demonstrate how values and issues, citizenship and critical awareness of the impact of design and of technology on society may also be addressed.

A Year 2 teacher undertook a puppet-making project (D&T Unit 2B) with his class which involved children making puppets in order to tell a story. Working in groups of four, the children looked at the existing wooden spoon, sock and string puppet designs on the GridClub site and considered which type would work best for the different stories and characters they had in mind. The teacher also brought in examples of different types of puppet for the class to handle and evaluate. He showed the class a range of techniques for joining fabrics, the use of templates and paper patterns and allowed them to try out and evaluate the different techniques.

The teacher then showed the whole class further ideas for puppets from two other web pages. Having discussed as a class what they liked and disliked about the puppets they had seen and handled, each group made decisions about the type of puppet they would make and planned the materials they would use.

Children returned to the 'Design Studio' pages on subsequent occasions and used them to research how to make products as well as helping them to generate their own ideas.

You can view all of the web-based resources online at:

www.ictadvice.org.uk/webbasedresources

Inventive Kids

A resource about invention and innovation that encourages and provides inventive experiences for children through educational games.

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

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Any units

National Curriculum KS1 DT1a, 1c, 1e, 5a

National Curriculum KS2 DT1a, 1b, 3c, 5a

To set the context of a Year 6 D&T Unit, children were told that they were going on a mission to find out about inventions and inventors. This series of focused tasks was intended to foster designing skills and to increase children's knowledge and understanding of the manufactured world.

Children first played the 'My Inventive Room' game on the large screen as a way of getting them to think about some of the technological inventions that they take for granted. The teacher asked when and where they invented, and what we would do without them.

The class worked in pairs and were allocated two inventions each to research. They used the 'Name That Invention' and 'Time Machine' games to gather information. Each pair swapped and discussed their findings with two other pairs.

The children were then asked to choose an existing invention and improve or re-invent it, or to come up with an invention of their own. They reported back to the class on what they had invented, its purpose, who would use it and what need it would meet.

What? Where? When? Why?

The What? Where? When? Why? pages of the BBC Scotland Education site are very visual and provide simple explanations on topics including textile technology and homes. They are useful in supporting a number of the D&T Units, particularly 'Slippers' (Unit 6A) and 'Money containers' (Unit 6B).

URL: **http://www.bbc.co.uk/scotland/education/whatwherewhenwhy/index.shtml**

Additional sites:

Kent Grid for Learning: **http://www.kented.org.uk/ngfl/dt/2d-josephs-coat.doc**

Stockport Education Service: **http://www.stockportmbc.gov.uk/primary/stpauls/year2/josephscoat.htm**

BBC Scotland Education Technology index: **http://www.bbc.co.uk/scotland/education/as/tech/index_html.shtml**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 1D, 2B, 2D, 4A, 6A, 6B

National Curriculum KS1 DT1a, 1b, 1c, 1d, 1e, 2b, 2c, 4a, 5a, 5b

National Curriculum KS2:DT1a, 1c, 1d, 2c, 2d, 4b, 5a, 5b

As an introduction to D&T Unit 2D, 'Joseph's Coat', a Year 2 teacher wished to raise children's awareness of how, where and why textiles are used, and decided to develop this knowledge and understanding using some of the information and activities on the BBC Scotland site. The children began the topic by discussing the many and varied uses of textiles in everyday life, illustrated by examples provided by the teacher. They were then set the task of exploring the What? Where? and Why? web pages and to answer questions about why we need different types of clothing.

Children were shown outline drawings of a simple 'T' shaped coat, similar to that which Joseph might have worn, and examples of coats made at a Stockport school which helped them to come up with their own ideas for decorating their colourful coats. They produced a paper pattern of the component pieces, used this to cut out the fabric and glued or stapled pieces together to make a model garment. This led to discussing what Joseph's coat would need to be like and children making a list. This specification was later used to evaluate how successful they had been.

Children then used the interactive planning activity on the What? Where? pages to investigate the stages involved in the process of designing and making clothes, before the teacher helped them to produce their own plan for making.

The teacher downloaded a worksheet on the Kent Grid site and this was completed by children during the project as a record of their designing and making.

Flying Pig

The Flying Pig site provides information for teachers and children of all ages and specifically supports the topics of mechanisms through animation and illustrations. Excellent examples can also be found at the Cabaret Mechanical Theatre site.

URL: **http://www.flying-pig.co.uk**

Additional site:

Cabaret Mechanical Theatre: **http://pie.exploratorium.edu/scrapbook/cabaret/**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 1A, 1B, 1D, 2A, 2C, 4B, 5C

National Curriculum KS1 DT1e, 4b, 5a

National Curriculum KS2 DT1a, 1b, 1d, 4b, 4c, 5b

A Year 5 teacher decided to use the Flying Pig resource as initial stimulus for D&T Unit 5C, 'Moving Toys', having previously used it successfully in Year 4 for Unit 4B, 'Storybooks'. She demonstrated on the large screen some of the automata examples from the Cabaret Mechanical Theatre as well as the Flying Pig examples. Children discussed which ones they most liked and why.

In pairs, children then chose one of the printable model downloads from the Flying Pig site, constructed it and evaluated it as a moving toy. They also looked at some moving toys made by a previous class and came up with a set of criteria that a good moving toy should meet.

Having decided which toy they wanted to make, the children were asked to explain exactly what type of movement they wanted their toy to have. Using the large screen, the teacher used the two websites to promote class discussion on the tools and techniques they would need to use. From this they produced sketches, lists and plans for their designs.

The facility on the Flying Pig site to ask questions of experts was used during making. The teacher made a list on the board of any technical issues that pupils had found difficult to solve. These were answered via the website and helped children with their problem-solving.

Since undertaking the 'Moving Toys' project, children have regularly re-visited both the sites, finding them visually exciting and easy to navigate without the teacher's support.

HowStuffWorks

The fascinating stories behind everyday technologies may be used to foster children's curiosity, creativity and quest for knowledge. Each of the sites listed here provides a wealth of information useful for finding out about products and systems and supports links between D&T and science.

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

Additional sites:

Tim Hunkin: **http://www.timhunkin.com**

Secret Life of Machines: **http://www.secretlifeofmachines.com/index.shtml**

Rudiments of Wisdom: **http://www.rudimentsofwisdom.com/**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2: most units, but particularly 1A, 1B, 1D, 2A, 2B, 2C, 3A, 3C, 3D, 4A, 4C, 4D, 4E, 5A, 5B, C, 5D, 6A

National Curriculum KS1 DT1e, 4b, 5a

National Curriculum KS2 DT1a, 1d, 4b, 4c, 5b

Crocodile Clips

Crocodile Clips provide free, downloadable simulation software which enables children to model their own circuits on the computer screen.

URL: **http://www.crocodile-clips.com**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 4C, 4D, 4E

National Curriculum KS2 DT1c, 3a, 3c, 4c, 4d

Children had earlier undertaken Science Unit 2F, 'Using Electricity' and ICT Unit 5E, 'Controlling devices', where they had mastered the basics of creating a sequence of direct instructions to control a number of output devices, constructing parallel and series circuits.

The teacher wanted to further develop this knowledge within D&T Unit 6D, 'Controllable Vehicles'. Children worked in pairs with Crocodile Clips software to model a circuit for a vehicle they had already made from a construction kit. They were encouraged to investigate different switches that could be used to control their vehicles and to ask one another such questions as:

- *Does the circuit work?*
- *How could it be improved?*

Having ensured that their circuits worked, these were taken to a neighbouring secondary school where they were converted into printed circuit board layouts and made as part of a transition project between Key Stage 2 and Key Stage 3.

As an introduction to a Year 4 D&T Unit, a teacher planned a focused task that required children to evaluate everyday products and explore how they work. She put children into pairs and provided a list of products from which they could choose one to investigate. These were: telephone, sewing machine, mobile phone, food mixer, shoes, hats, video recorder, ball point pen, torch and light bulb.

These particular products were chosen because actual examples could also be provided for the children to handle. From information found on the websites, as well as that gained from handling the actual products, children created a PowerPoint presentation which would tell the story behind their chosen product. They were asked to include information about the purpose and function of the product, its key features and to say why they thought it was an important part of everyday life. Each pair made their presentation to the rest of the class on the large screen and the presentations were printed out to form a wall display entitled 'Everyday Technology'.

Children subsequently went on to make a list of the characteristics and features they felt were important for the design of their product. These were divided into 'essential' and 'desirable' features and helped them to understand about specifications.

Food Standards Agency Wales

The Food Standards Agency (FSA) Wales provides a selection of interactive games, in both Welsh and English, to support teaching and learning about food safety and healthy eating for 5–11-year-olds.

URLs:

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

Mission Control materials: **http://archive.food.gov.uk/hea/index2.html**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Units: 1C, 3B, 5B, 5D

National Curriculum KS1 DT2a, 2f, 4a, 5b, 5c

National Curriculum KS2 DT1c, 2a, 2f, 3c, 5b, 5c

Create a Graph

These pages provide access to a simple program which helps pupils to display the results of any surveys they have undertaken. Note that as the site is American, spellings are in English (US).

URL: **http://www.nces.ed.gov/nceskids/graphing**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2: any units

National Curriculum KS1 DT1e, 3c, 5a

National Curriculum KS2 DT1a, 1d, 5a

Since most primary schools do not have a designated food area, and children would not necessarily have responsibility for refrigerating food, the teacher chose to address this important element of risk assessment through modelling on the computer as an alternative. This was built into D&T Unit 3B, 'Sandwiches'. Having played the 'Chill out! Stack your Fridge' game on the FSA site, the Year 3 children were challenged on what they knew about food safety and hygiene. They were then asked to say where and how they would store each of the ingredients going into their sandwich snack. They were also asked to explain where and for how long their finished sandwich should be stored. At each stage they were encouraged to talk about the reasons behind their decisions.

The teacher also made use of the Food Hygiene Mission Control materials on the FSA site where children learnt about food safety and hygiene through The Adventures of Safe-T and the H-Squad characters.

As part of D&T Unit 4A, 'Money containers', children carried out a survey of user preferences in relation to types of containers. They were provided with a collection of different money containers, such as purses, wallets and belt bags, and carried out a class survey to find out which was the most popular.

Children were asked such questions as:

- *Which purse is most suitable for a child?*
- *Which would be safest to keep your money in?*
- *Which style and finish do you prefer?*

They entered their poll results into the 'Create a Graph' page, produced a bar chart and used their findings to draw up a list of criteria for a successful money container for a person of their age to carry in school.

Our daily bread

There are a number of excellent sites providing plenty of visual information to support the topic of bread. Some are selected here to exemplify how teachers can get the best out of a number of websites.

URLs:

Food Forum: **http://www.foodforum.org.uk/curriculum/Baking_Teacher_Guidance.shtml**

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

Wright's Flour: **http://www.wrightsflour.co.uk**

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

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

Bakers' Federation: **http://www.bakersfederation.co.uk**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Unit: 5B

National Curriculum KS2 DT1a, 1c, 1d, 4a, 4b

These Year 5 children began D&T Unit 5B 'Bread' by being asked to name and describe all the different types of bread they knew. They recorded their findings on the Food Forum worksheet 'Being a bread detective' which the teacher had downloaded and printed in advance of the lesson (one of four Food Forum 'Bringing Baking to Life' worksheets used throughout the project). Because the teacher found that children's experience of breads was limited, he used the 'Our Products' section of the Warburtons site to show visuals of a broader range.

The photographic storyboard in the educational section of the Warburtons site was then used to demonstrate to children 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 a loaf of bread so that children could relate the two processes. As he demonstrated each stage, children were asked to come out to the whiteboard and identify key aspects of the process.

Simple visual manufacturing flowcharts from the Sainsbury's site were used to help children explore the commercial manufacture of bread. They related this to their own bread making activity, discussing the similarities and differences between these processes. Some children carried out further research on bread as extension work using other websites.

A web-based recipe database for products made from bread mixes (on the Wright's site) was used by children at the stage when they were generating and developing their own bread product design ideas. They evaluated all outcomes and the recipes for those voted most successful were submitted to Wright's to add to their online recipe database. Children were delighted to see these published and it gave them the idea to create their own online school recipe database of successful products that had been made by different classes.

During making, the children worked in production teams of four, with one child responsible for supervising production and quality assurance throughout. This child also kept a photographic record of the stages in their group's bread-making with a digital camera. These were later downloaded onto the computer and used to produce a visual storyboard – modelled on those seen earlier on websites.

How do fruit and vegetables grow?

The Soil Association pages address organic farming issues and the impact of design and technology on the environment.

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

Additional sites:

Sainsbury: **http://www.jsainsbury.co.uk/education/tasteofsuccess/primary.htm**

Food for Life materials:
http://www.farmtrails.org.uk/fflcurrpack/foodforlife/t1ks1.htm

Relevant to the following:

D&T Scheme of Work for KS1 Units: 1C

National Curriculum KS1 DT1e, 5a

Using the Soil Association website, children were guided by the teacher around the virtual farm trail at Meanwood Valley Urban Farm which involved them identifying the parts of different vegetables and fruits. The teacher felt that this would add another dimension to work they were doing on naming plant parts, classifying and grouping vegetables and fruits.

The teacher downloaded and printed several of the resource and activity sheets from the Food for Life site to support children's learning about where food comes from and how it is processed along the way before reaching the table.

As part of this work on fruits and vegetables the teacher also demonstrated materials on the Sainsbury's site which included visual pages about different fruits (Fantastic Fruits) and a virtual tour of a food store to see how and where fruit is sold.

Divine chocolate

An exciting site from which to explore Fair trade issues, thereby incorporating aspects of citizenship and education for sustainable development into D&T. 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**

Relevant to the following:

D&T Scheme of Work for KS1 and KS2 Any units

National Curriculum KS1 DT1e,5a

National Curriculum KS2 DT3c, 5a

As part of a series of activities planned by a school for Fairtrade fortnight (which takes place annually in March) a Year 6 class were set a number of focused tasks about where different materials come from, 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. Children 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 children to better understand the process of chocolate manufacture, the teacher demonstrated how chocolate is tempered and the children produced chocolate novelty shapes.

They then evaluated the designs in the Dubble packaging wrapper gallery and designed their own Fairtrade wrappers for their novelties which would encourage people to choose Fairtrade products. The teacher returned to Fairtrade issues in subsequent D&T units of work where children were encouraged to use their knowledge to consider the broader impact of their designs.

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