



### **ICT in Design and Technology at Key Stage 3**

Design and Technology activities are intended to prepare pupils to participate in a world of changing technologies. The National Curriculum orders for Design and Technology require pupils to become autonomous and creative problem solvers. They must identify needs, wants and opportunities and respond to them by developing a range of ideas, and making products and systems, which include the use of ICT.

#### **The QCA Schemes of work**

The QCA Schemes of work identify two major areas of ICT activity with Units of work within each year of Key Stage 3.

- Using ICT
- Using Control

There are additionally opportunities to use ICT to support all Design and Technology work through the use of CD-Roms and the Internet for research and for the design, testing and evaluation of products.

#### **Using ICT (Units 7C, 8C and 9C)**

- In Year 7 (Unit 7C) pupils use ICT to support researching and designing. Teachers can choose from 3 Design and Make assignments (DMAs) on the themes - Stencils (resistant materials), Sports Drink (food) or Maze game (resistant materials) .

ICT is used

- to design and cut stencils OR
- to model the cost and nutritional profile of a drink (spreadsheet) OR
- to design and produce a game using a computer controlled milling machine

In all 3 DMAs ICT is also used to research materials, components or ingredients, to model ideas, to simulate systems and test designs.

Focus practical tasks provide opportunities to learn the skills required for these activities.

- In Year 8 (Unit 8C) the focus is on using ICT to support making. ICT is used to plan, design and make products using Computer aided manufacture (CAM). There are 3 DMAs on the themes of Computer pewter (resistant materials), moulds and production aids for food production (resistant materials and food) and a T-Shirt challenge (textiles). ICT is used in all three tasks for computer aided manufacture using CNC (Computer numerically controlled) machines.

- In Year 9 (Unit 9C) ICT is used to forge links with the world outside school. In this Unit pupils work in teams to produce a product. There are 2 DMAs , *Corporate Identity* (promotional products) or *Going Public* (promoting community facilities).

ICT is used

- To access expertise and help for the project via e-mail, fax or conferencing.
- For research using CD-Roms or the Internet
- For Computer aided design and manufacture of products

## Using Control (Units 7D, 8D and 9D)

- In Year 7 (Unit 7D) the Unit focuses on electrical and mechanical control to control a point of sale display.

ICT is used

- For Computer aided design and manufacture of products e.g. a computer controlled vinyl cutter
- Word processing/desk-top publishing

- In Year 8 (Unit 8D) the focus is on the programming of a computer based controller when using control for security

ICT is used

- To design a computer controlled system e.g. to prevent theft, detect tampering or to control access including control of outputs, monitoring of inputs, procedures, connecting input and output devices to the controller

- In Year 9 (Unit 9D) the Unit focuses on designing and making electronic circuits for control when using control for electronic monitoring. The DMA focuses on an electronic product that could be used to care for someone or something

ICT is used

- To design a printed circuit board
- To model in 3D
- For CAD/CAM e.g. vinyl cutter

The CAD/CAM experience is further developed in Units 9Bii and 9B iii Designing for Markets (resistant materials and textiles). These units require pupils to make a product for a mini-enterprise or craft fair.

### Long term planning

Some of the ICT skills required for these Units of work will have been introduced in ICT lessons. It is advisable to liaise with the ICT department to ensure that the timing for these activities is coordinated.

e.g. Unit 6 (Yr 7) ICT will introduce the skills which are further developed in Unit 7D (Yr 7) D&T.  
Unit 8C (Year 8 D&T) introduces project management software which is further developed in Unit 15 (Year 9)

A checklist of software for Design and Technology is provided. You may find it helpful to list the software in the D&T department to identify gaps in provision. A software list, which meets these requirements, is available from the ICT Support Team. Contact The Abbey Centre on 01296 428402 or The IT Adviser on 01296 383376.

### Hardware

Digital camera

Scanner

Computer controlled Milling machine, lathe, plotter

Computer controlled embroidery, knitting or weaving machine

### Key Stage 3 Software audit for Design and Technology

QCA Unit	Application	Software	Located
D&T Unit 7C Stencils/Maze game  Sports Drink  Maze game  FPTs	2D design +Computer controlled plotter/cutter  Spreadsheet  Database package and Databases for information –food analysis  CNC Milling machine  Software to operate circuits on screen.  2D and 3D design  Graphics software (fabric design)		
D&T Unit 8C  Computer Pewter  Moulds and production aids  T-Shirt challenge  FPTs	CAD/CAM + milling or engraving machine  CAM produced formers  CAM produced templates  CAM produced dies  CAM system to produce embroidery design.  Flow-chart software, project management or planning software.  Graphics software,and transfer to fabric  Plotter/cutter to produce full size stencils  Computerised sewing, weaving or knitting machine.  2D design (Nets)  DTP Software.  Drafting software (technical drawings)  Production simulation software.  Milling software (on-screen graphical simulation)  Software to investigate a range of hazards in food production.		

D&T Unit 9C	<p>Computer mediated communications (CMC) e.g. e-mail, Fax, Internet.</p> <p>Data Base software to create survey.</p> <p>CD-Roms for research.</p> <p>CAD/CAM systems e.g. embroidery machine</p> <p>Software to print designs onto fabric.</p>		
D&T Unit 7D	<p>Control box and software to produce active or moving point of sale display</p> <p>CAD/CAM System e.g. computer controlled vinyl cutter</p>		
D&T Unit 8D	<p>Control box and software to create a security system</p> <p>Computer controller (which can work independently of computer once programmed).</p> <p>An embedded control system.</p> <p>Input and output devices</p>		
D&T Unit 9D	<p>PCB design Software</p> <p>CAD/CAM</p> <p>CAD/CAM System e.g. computer controlled vinyl cutter</p> <p>An embedded control system</p>		
D&T Unit 9B ii/iii	<p>CAD/CAM software to drive a milling machine, lathe, plotter</p>		