Teaching technology by television

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The enthusiasm of the media to deliver support materials for teachers grows as national curriculum technology moves closer. School TV is no exception BBC and ITV Thames have made major new series.

The differences between the two series are fundamental. *Techno,* the BBC series currently showing on Monday mornings, sets out to dazzle the key stage three viewers with sets and camera work reminiscent of *Top of the Pops* and *Dr Who*. The 10 20-minute programmes each contain four items that are not necessarily related. In each, the first is a Case Study of a technology story presented in a *Tomorrow's World* format, followed by a Challenge with a design problem brief focused on attainment levels three to seven, with examples of possible materials, processes and solutions. This is followed by an Evaluation whereby a range of newly-designed objects are appraised. Finally there is a Prototype, where a prospective solution is explored by modelling, mock-ups and simulations.

Individually all the components are impressive and a tribute to the perception and energy of the production team and the series adviser. The sheer eclecticism of the programmes is remarkable — paper engineering, computer control, making bread, redesigning the Filofax and new musical instruments, to name but a few. Yet taken in their entirety all of the 20-minute programmes are likely to be indigestible. Not only are the four components often unrelated, but they are also over-rich — particulary in the programme on aesthetics and design, where the producers sock the viewers with soft-tech motorbikes and radio cassette players, pop fashion and pop magazines in 20 minutes flat.

Separating out the components will not only offer more digestible material but will also help to overcome the inevitable conflict between the sophisticated technology presentations in the Case Studies, Evaluation and Prototypes and the more modest activities offered to viewers in the Challenges. The risk that viewers may have feelings of inadequacy when they compare their own achievement with the high-tech projects displayed is great — particularly when a very high proportion of the approved examples come from Japan. It is at times as if the viewers are being told that if they are not Japanese their chances of success are diminished. Perhaps it is a pity that camera crews did not film some Japanese schools during their visit.

The 10 15-minute Thames programme currently being shown on Thursday mornings on Channel 4, take us back into

2 PAPER POWER

Programme summary

We tend to overlook paper as a material for anything other than writing or drawing on, (or reading the news from!). This programme looks at two designers who use paper in a different way – to make three-dimensional forms – and shows how a basic, flimsy, flat sheet of paper is transformed into strong, still structures.

Lyn Hourahine is a pop-up card designer who has literally added a new dimension to the greetings card market using paper engineering techniques.

Deborah Schneebeli-Morrell is an artist who, having found two dimensional painting limiting, uses newsprint to make 3-D, papier-mâché forms. Both demonstrate some of the techniques they employ in their work and explain how their designs have evolved.

Suggested activities

1 Testing paper. This programme illustrates a number of ways in which paper can be strengthened, but how strong is an ordinary piece of paper under tension? Students could devise an investigation to see how much weight could be hung onto a strip of paper, say, 10mm wide. Although it seems to be a straightforward task, students will need to decide on the following:

- How long should the test strip be?
- How wide should the test strip be?
- How should I suspend it?
- How should I attach the masses?
- What mass should I start with and by how much should I increase it for each test?
- Should I repeat the test?
- What sorts of paper should I use?

These questions will need to be carefully considered so that a range of papers can be tested with reliable and consistent results for comparison.

2 Carrier bags are a convenient way of holding shopping. Most chain stores and supermarkets provide them and use them for advertising and promotion. Students can try to design a paper carrier bag from a single A1 sheet of sugar paper. It may be necessary to take an existing bag to pieces in order to find out exactly how the bag shape can be formed from a flat sheet. There are two main places of weakness to consider – the handles and the seam. If a hole is punched in the sides of the bag, it can lead to stress concentration. Reinforcement can be added to counteract this.

It is also worth considering the problems of mass production. Students should ask questions like:

- How skilled would they need to be to produce the bags?
- How much time would it take?
- How much could you produce the bag for?
- How much could it be sold for?
- How much training would be required to make the bags?

Obviously, the area of graphics offers much scope for further development on a project such as this.

3 Story cards. Some of the paper folding and card mechanisms seen in the programme and on the Activity Sheet could be used to design a series of cards for use by a primary school teacher telling a story to a reception class. Each card should be A1 size and have a simple picture in which movement occurs – the sun rising, rain falling, a rainbow appearing, people or animal moving, mouths opening, etc. This could provide an opportunity for students to write a story and design the cards for their story. After initially, the cards could be designed as a series of characters and events. The teacher or class would then use them to make up stories.

ACTIVITY SHEET

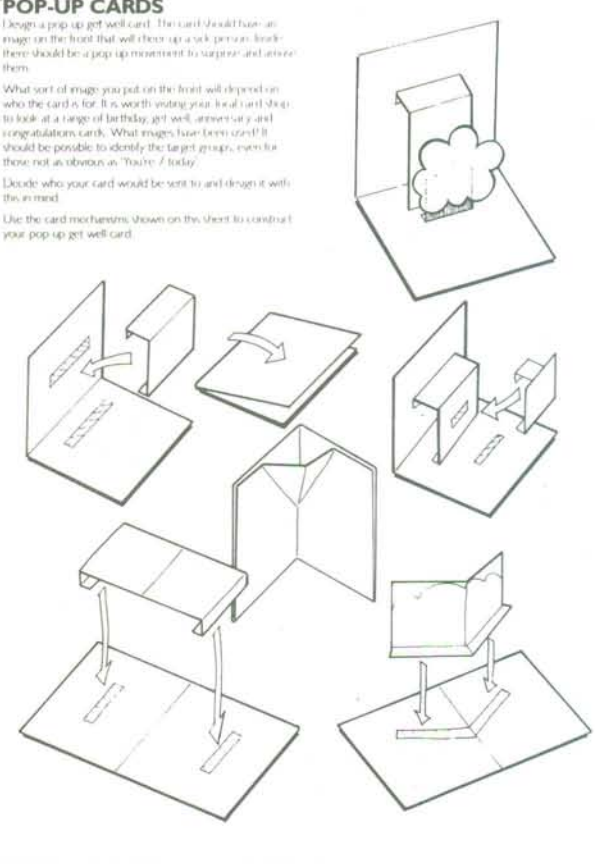
POP-UP CARDS

Design a pop up get well card. The card should have an image on the front that will cheer up a sick person. Inside there should be a pop up movement to surprise and amuse them.

What sort of image you put on the front will depend on who the card is for. It is worth visiting your local card shop to look at a range of birthday, get well, answer to y and congratulations cards. What images have been used? It should be possible to identify the target groups, even for those not as obvious as 'You're 7 today'.

Decide who your card would be sent to and design it with this in mind.

Use the card mechanisms shown on the sheet to construct your pop up get well card.



the world of mainstream current affairs. Despite some clever cartoon sequences, much of the information is presented by serious, responsible talking heads. Though highly informative they are, at times, rather ponderous — for instance in the fairly laboured discussion on the distinction between energy and fuel.

Focused on national curriculum Technology but also on current GCSE syllabuses, the new series is still modestly labelled *Design and Technology*. The 10 new programmes consist of five dealing with issues of energy and five on materials. Each leaves no stone unturned in its exhaustive examination of issues such as public transport, energy saving, alternative technology, nuclear power, choice of materials, material technology and conservation.

Throughout, the focus is on how to solve problems without creating new ones. There are some excellent visual sequences such as the use made of materials in designing the new Doncaster Leisure Dome, the work with timber at Hooke Park, the problems of Birmingham Transport and the work of the alternative technology centre at Machynlleth.

Teachers will probably be more at ease with the Thames series. It delivers what many have come to expect from School TV — visual input and the implant of authorities not otherwise available to the schools. It leaves the organization and structure of learning and the determination of class activity firmly in the hands of the teacher.

The BBC offers a different product seeking to motivate students directly and to influence their classroom activities leaving teachers to adjust to the consequences. Teachers who use it will have to come to terms with two powerful external forces, not only the national curriculum but also persuasive television. The brave will go for the BBC model — but many will prefer the Thames offering. The wise will select both.

Pages from the Teacher Guide, Design & Technology — Materials
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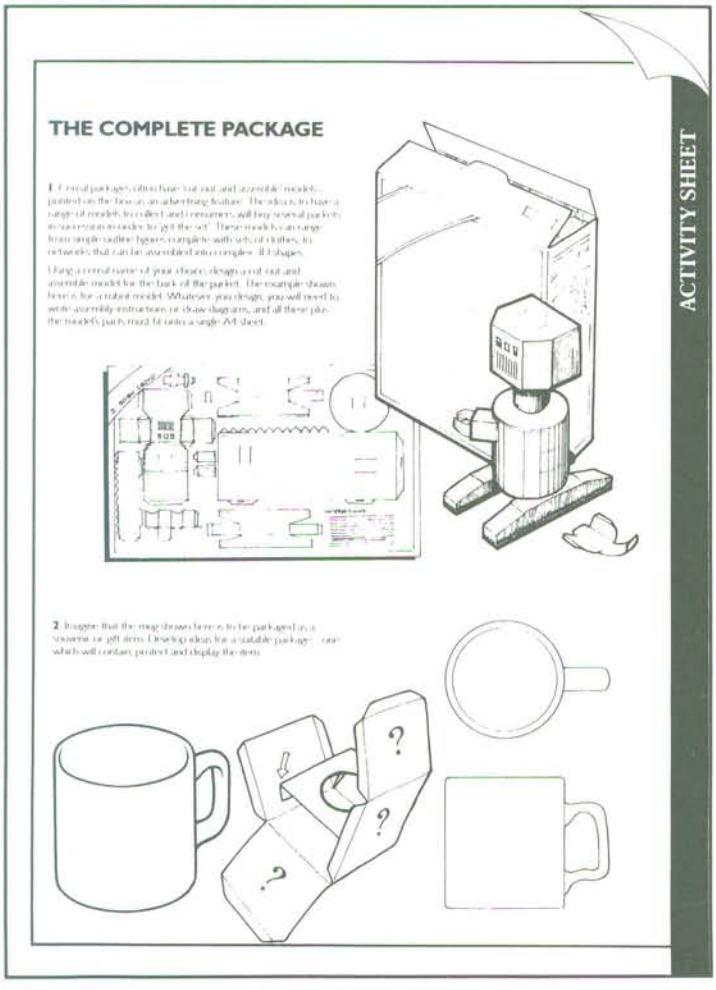

5 GOING TO WASTE?

Programme summary

The waste we are all most familiar with is that which is collected from our dustbins. Every year, each household in the UK produces about one tonne of waste. The majority of this has traditionally been disposed of in landfill sites. As well as being seen by many people as an unsatisfactory solution to the problem, landfill sites are in short supply and, perhaps more importantly, they ignore the fact that much of the waste contains potentially valuable material.

The programme focuses on the measures being adopted in Sheffield to tackle the problem of waste. It looks particularly at attempts to recycle some of the waste materials – paper and board, glass, metals and plastics. How will their aim of recycling be achieved . . . and is it really worth it?

Suggested activities

1 Recycling waste. All families in the UK produce a lot of waste each week which ends up in the dustbin – packaging (glass bottles and jars, tins, plastic and paper wrappings), dirt and dust from the vacuum cleaners, left-over food, fruit and vegetable peelings, old newspapers. Students can investigate the problem by monitoring what happens to the refuse in their own households. Start by keeping a list of all the items that are thrown away during a week, and try to put this waste into categories: glass, paper and card, plastics, organic, etc.

Can any of the waste be recycled and, if so, what are the local recycling facilities? Local councils often have recycling officers who can offer advice, and the *Yellow Pages* could give some information about reclamation services. A lot of this information might be best presented on a map.

- What happens to the refuse after it has been collected?
- Where is it taken?
- What processes does it go through?
- Who does it?
- How much does it cost?
- Who pays for it?

The school willl produce a lot of waste as well. Students could undertake a study to see if there are any ways of cutting down on waste or putting recycling schemes into practice.

2 Recycling aluminium. Aluminium is very costly to produce. Current estimates suggest that there is enough aluminium ore to provide all the aluminium we need for about 40 years. This assumes that we continue to use aluminium at the present rate. Clearly, recycling should be considered. Students could try to estimate how much aluminium foil in the form of milk bottle tops is thrown away by a household in one year. Students may find it difficult to develop a strategy for this kind of estimating, so this approach could be suggested:

- Find out how many bottles of milk the household has each week.
- Find the mass of a milk bottle top. You may need to suggest that ten are weighed and the result divided by ten, depending on the sensitivity of available equipment.
- Multiply the mass of a single top by the number of tops thrown away per week.
- Calculate the approximate amount thrown away each year by multiplying by 50 (two weeks holiday!).
- Further estimates could be made for roads, schools or even small towns.
- Students can compare their estimates and also try to find out the possible value of the bottle tops.

3 Industrial waste. Industrial activity nearly always produces waste products. Students could identify industrial sites in their area, find out what they produce and what waste is likely to be generated. An investigation into how any waste is processed, and what precautions are taken to minimize environmental harm, will need to be conducted carefully and tactfully.

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