

# Project work at Wyedean School

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*Wyedean School, Chepstow*

Wyedean School is a smallish comprehensive school on the fringe of Chepstow, Gwent, but is in Gloucestershire. There are approximately 650 pupils and the Design Department comprises, art and ceramic, design/technology, and home economics and textiles.

In 1988, the County Technology Advisor, Dr. Boyd Gunnell, encouraged us to consider, and helped to put into effect our first Science/Design Cross Curricular project. We looked on it as a pilot, so if it went well, may be the start of a regular event. Subsequently, other projects developed in conjunction with the Science Department, and a pattern of managing future co-operative ventures emerged, each with its own peculiar problems and bonuses.

For timing in the year, June/July seemed appropriate. We could take advantage of spare capacity in rooms and staffing because Year 10 and 12 pupils were off timetable. Design and Science lessons were 'pooled' and a few periods 'stolen' with 'free' periods given up by staff.

In 1988 and 1989 the projects involved a minimum of staff from each department. Enough to work in pairs and share workshop and laboratory facilities, also science technicians. Only one group of mixed ability boys and girls took part, about 20 in number.

For the Staff, evaluating the management of the projects revealed what in hindsight was the obvious, that teachers of different disciplines had to find a way to support and overlap each other, and they needed a variety of transferable skills. After all that's what we wanted the pupils to acquire. For the future it was essential that the right staff were in the right place, workshop and laboratory, or both in the same place but not contradicting each other through advice to pupils, consequently confusing them and being seen as a 'spanner in the works'. To broaden their expertise, two teachers — one the Head, undertook a County machinery operating course. Ultimately the other teacher — a physics specialist, became responsible for teaching a GCSE Technology course within the Design Department! Physics resources were not a problem and our emphasis was on making, but support material took a while to compile.

Pupils were required to make both a verbal and visual presentation to their peers which included an evaluation of their results.

Both departments were sufficiently enthused by this previous experience to plan for 1990, A Cross Curricular project for the whole year group — Year 8. This resulted in 4 unrelated projects undertaken over two weeks with one teacher from each department working in pairs. A fair amount of planning between the pairs occurred and it soon became clear that a co-ordinator was needed to oversee smooth running and liaising, not only for rooming but with technician support to get out prepared equipment, the SMT, and consulting with other heads of departments who were going to lose a little teaching time with the year group. This task was undertaken by the Head of Science, John Nettleship.

Thus approx. 16 x ¾ hour periods were generated most of these double manned, and most also with a free choice between a science laboratory and design workshop as





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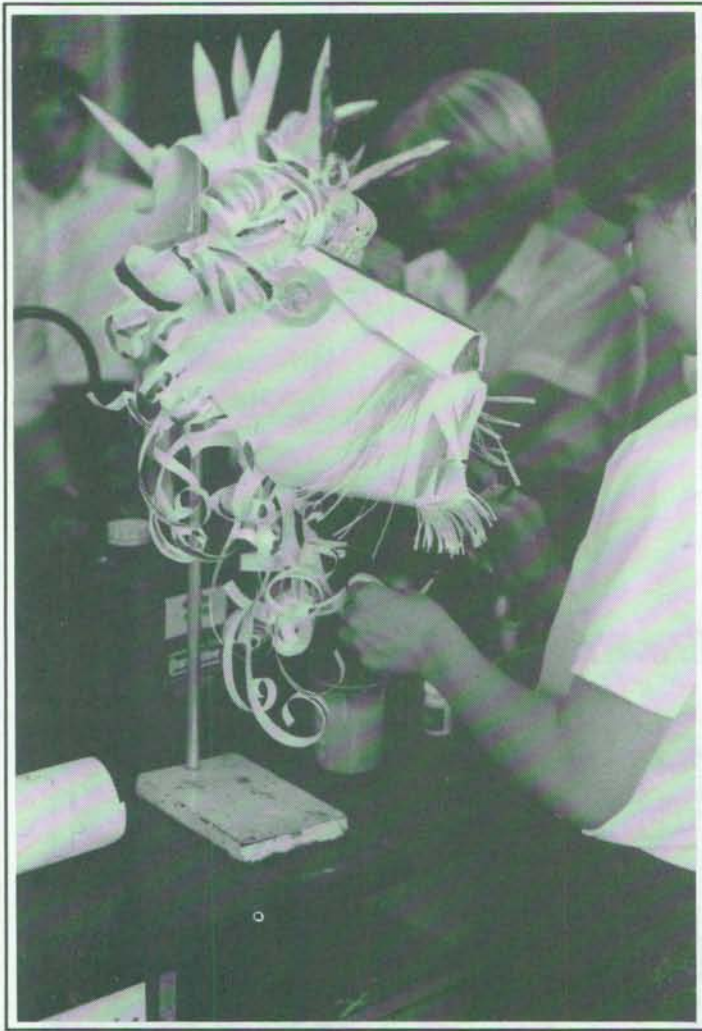
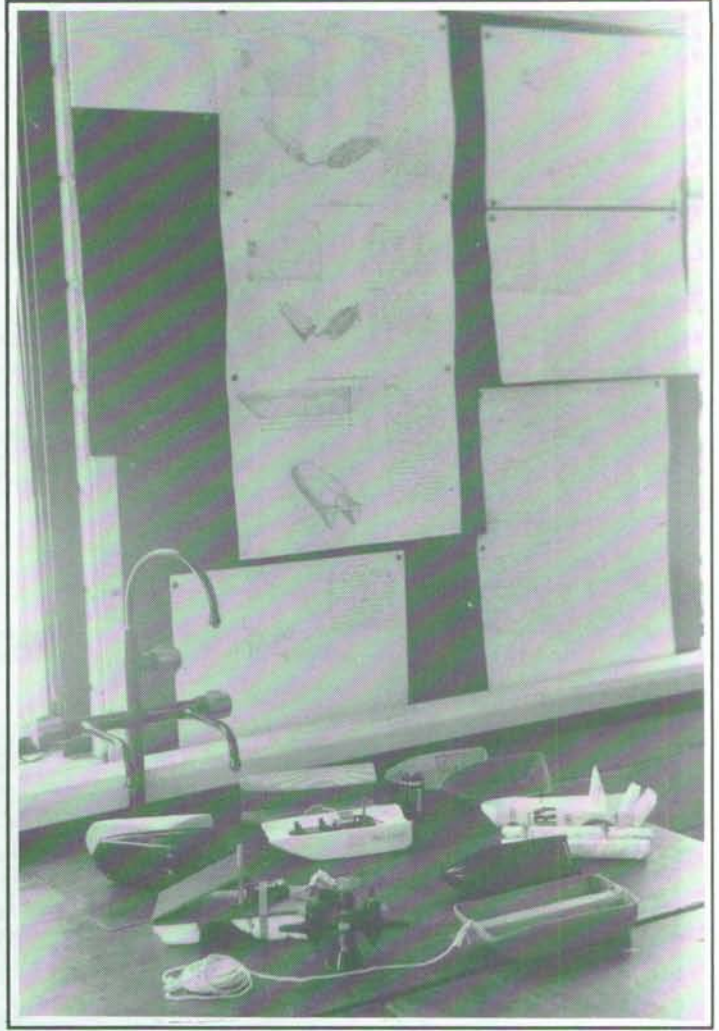
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appropriate. The staff of the two departments had to cover the loss of about 10 periods which would have otherwise been 'free'. Also classes of other year groups suffered loss of their normal teacher for about 10 periods.

### ☐ The Themes

Each pair of staff were able to plan for some weeks in advance. The themes are outlined here for each Tutor Group — more details and photographs constitute the closing pages of this report. A fragmentary record on videotape was also kept.

- A8 Inter-relationships of light and colour explored first as a Science investigation and later by making and painting a 3D Animal Head Mask.
- B8 A Boat Race — pupils to design and make their own small boats using a variety of propulsion, encouragement to use vacuum forming as a process.
- C8 Primitive Pottery — pupils artefacts in clay to be baked in tin and progressing to larger improvised sawdust ovens.
- H8 Heat Conservation — pupils first investigate and measure the effectiveness of insulating materials, then design & make a model shelter.

### ☐ A8 Inter-relationships of light and colour

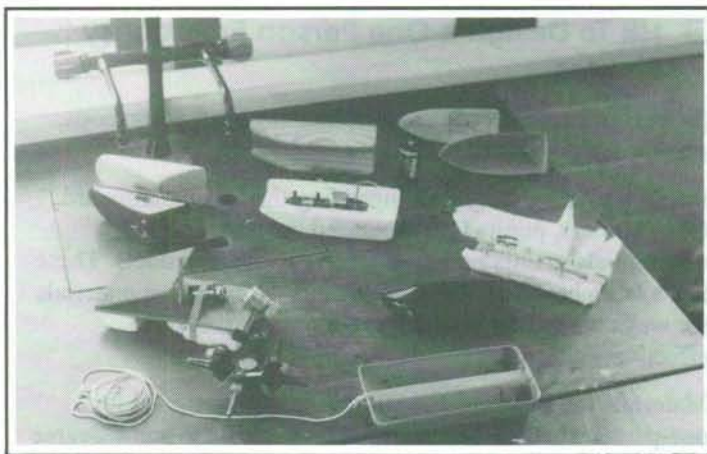
(Graham Wilde and Non Jones using Art room, Science Lab. and Dark Room).

The project was designed to illustrate, through practical experience how light itself or components of it, can effect the appearance of things. Initially coloured and patterned milk bottles subjected to different coloured lights. The usual physics ray boxes were used for this and laboratory blackout. Once this was confirmed pupils then in pairs made decorative head masks in white card. These were then further decorated with fluorescent paints which did not enhance the masks in daylight but were a 'WOW' when exposed to coloured lights.

The whole project had no absolute predicted outcome — like a piece of art, but contained a fair amount of physics, construction work, craftsmanship and artistry. The Design and Science teachers worked extremely well together and had planned the fundamentals of the project beforehand. During the making of the masks there was a lot of flexibility between both departments. In use of equipment and facilities.

The pupils enjoyed the whole project, it had variety and discovery for them and some were amazed by the results they achieved. By and large the boy/girl pairs co-operated well and their choice of partner was a surprise to us. The project





### Boats — products of six groups

was recorded by camera so a good record is available. The staff were thrilled with the outcome every bit as much as the pupils.

#### ☐ B8 A Boat Race

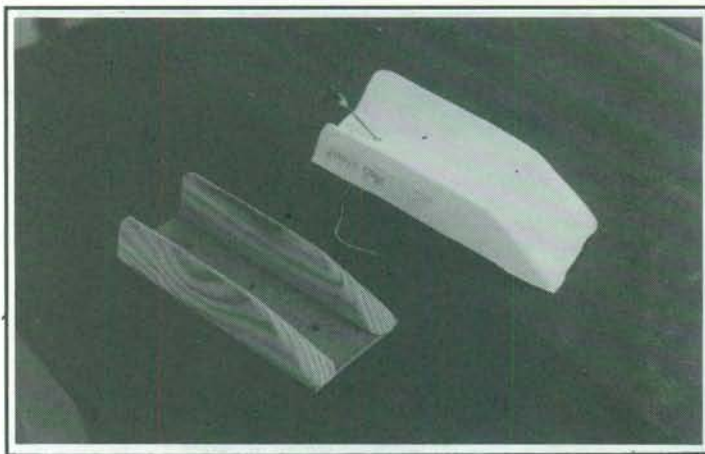
Bill Clarke and Jill Parker using craft workshop and space outdoors.

Pupils worked in 6 groups of 4 (or 3) and were challenged to design (including draw plans) boats to travel a 4m. length of guttering. Very hesitant at first, all except one or two became very keen. Unfortunately cross fertilisation led to 5 groups choosing battery powered propellers. Nevertheless there was many a test of ingenuity in deciding upon the details. Four groups made hulls by vacuum forming.

Two boats completed the course — best was a catamaran, one never moved. Fixing propellers to drive shafts was a big problem and caused disappointment. The ingenious rocket propelled boat developed into a rocket pulled one — very hazardous!



Firing of the brick kilns: they were left to smoulder overnight.



### The winning boat — a catamaran — and the mould used for vacuum forming the hull

Pupils learned from experience about drag, streamlining vacuum forming, electric connections and especially *teamwork* not a strong point of this particular class.

#### ☐ C8 Primitive Pottery

(Phyllis Lewis and Mike Thompson using Pottery room, Science lab and outdoors).

Starting point was a video of primitive man — this provoked thoughts of how they cooked etc. and design of suitable pots. Mini pots were made using differing techniques, designs varied.

Mini pots were fired in sawdust in tins to find out if and how much air is needed. Large pots were made (often did not follow original ideas). Differing methods of decoration/ means of keeping pot in shape were tried. Some used plaited string and grass to hold the shape.

Pupils designed a large kiln and the building of 2 kilns was undertaken using bricks. This led to overnight firing of pots



Products in the bottom of a brick kiln





and then organisation of a display and thoughts on success or failure of the firing.

The whole project was very enjoyable but more time was needed as making and drying pots is very time consuming. (no chance to achieve water proofing).

The chance to experiment with tin firings and to look at the temperatures involved was limited. Pupils enjoyed it, as their pots on the whole were successfully fired.

P.L. will use these kilns and tin firings as part of her Year 7 ceramics course so this must be a big plus for the 2 weeks.

#### Full size products from the primitive kilns

### ☐ H8 To Design a One Person Emergency Shelter

(Max Hawkins and Janet Anderton using craft workshops, science lab and a school tree).

Inspired by the thought of improving the lot of Cardboard City dwellers, pupils first measured the temperature differentials maintained by some ready-made models. These had a lamp bulb to simulate body heat. Alternative materials for walls were used in order to compare insulation effectiveness.

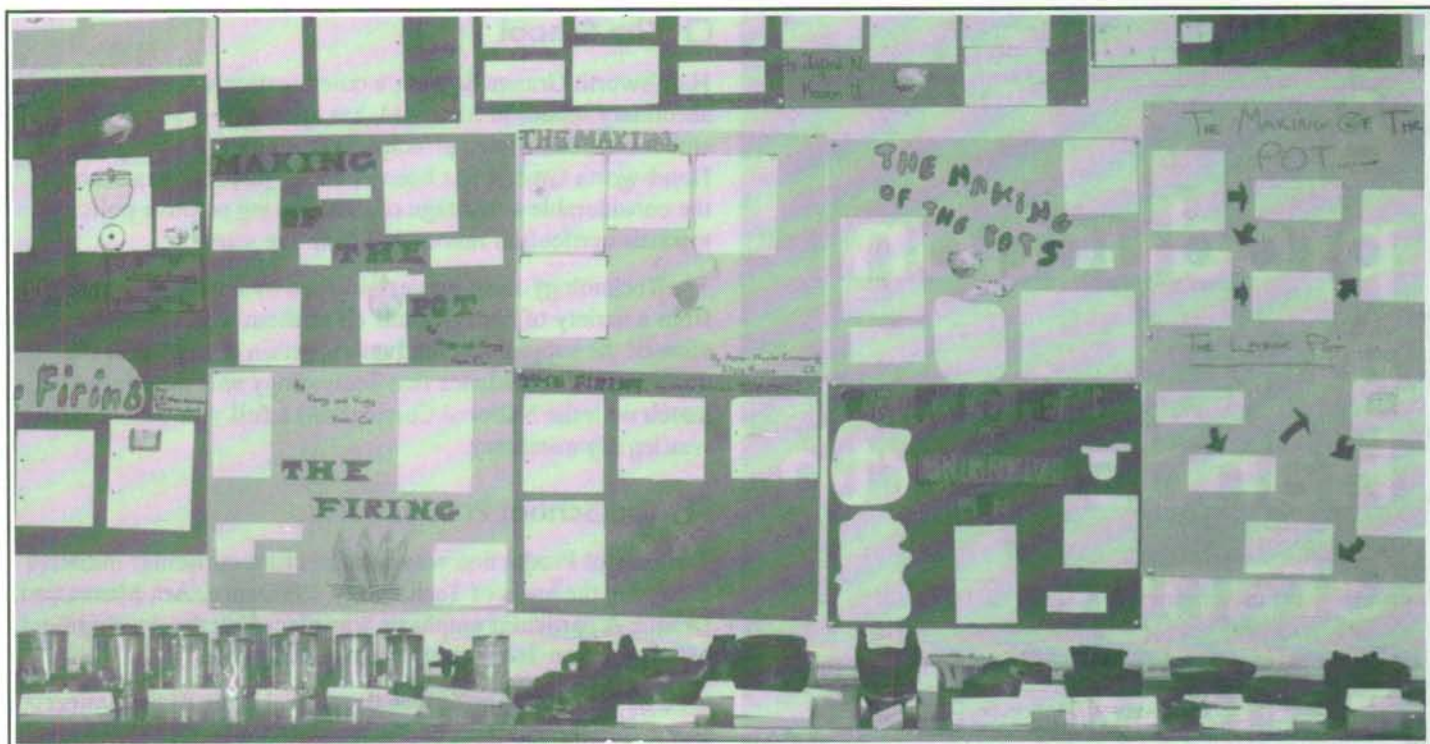
Materials were chosen and structures then designed for one-person shelters which would be portable to some degree and weatherproof. Scale models were constructed except by one group who insisted on using local natural materials. These constructed a branch shelter under a tree. Our main record of this theme is pupils folders and a video, mainly of their talks at the end. Preparing the talks was a valuable experience in itself, enriched by many well-pitched questions from Mr Hemming, Supply Teacher, English specialism.

### ☐ Investigation

The size of the shelter will depend upon the average size of a person, which will depend upon what position they would find most comfortable to be in for a long time. The measurements are approximately 1.70m in length and 0.55m in width when standing when sitting length is 0.80m width 1.00m and when lying 1.75m.







### ☐ Involvement outside school

Contact has been maintained with Ms Liz Cousins, SATRO Director and Dr Boyd Gunnell, Technology Adviser. Neighbourhood Engineers were informed. Up to £100 support was offered by ECRO (Engineering Council). School Governors, former Councillor Mr W Manson (Science) and Mr D Hazzard (Design) visited at the conclusion of the project.

### ☐ Conclusions

The whole Project was seen as very successful and beneficial to the pupils involved, whilst entailing an easily bearable level of disruption to staff and other pupils. Our conclusions do not differ much from those of the smaller projects undertaken in the previous two years. Staffing harmony was improved this time.

#### Benefits

1. achieved subject integration especially for A8 & H8.
2. enabled pupils to develop their ideas thoroughly.
3. pupils appreciated a wider use of equipment and materials especially B8 and H8.
4. Primitive technologies were appreciated by C8 and H8.
5. fulfilment for staff especially with A8 and C8.

#### Problems

1. other classes lost their normal teacher but over about 12 periods.
2. however due to the other activities occurring at the same time, some pupils did suffer a great deal of disruption. e.g. Yr 10 residential week which Science and Design staff were supporting.

3. direct relevance of science was less obvious for B8 and C8 but there was technology involvement.
4. next year we shall have more Year 8 pupils.
5. future years we may not have Year 10 released from timetable which in turn releases staff.

The most important commendation of this type of activity is that pupils are continually referring back to the projects over all three year groups that have so far taken part, 1988, 1989 and 1990.

### ☐ Influence of the National Curriculum requirements.

Pressure of time may force the Science Department to withdraw from this activity, though both Ms Cousins and Dr Gunnell are strongly in favour and point out that the broad aims of the NC are fulfilled very well by the Project. Unfortunately the science NC document is very narrow in its drafting.

Thus it seems that in future years the Design staff will mount this kind of activity within their own schedule, or else if a cross curricular arrangement is kept then this will need to be as part of a simultaneous programme for all K St 3 pupils.

Once the projects were underway a sense of achievement was discernible. Considering the time of year both pupils and staff felt a strong 'lift' out of the whole enterprise. Working in this way can be quite draining. Staff and pupils work faster and harder as momentum increases in such a concentration of time. There is a sense of fun generated all round because of the will to make it work. Both pupils and staff find themselves rising to unforeseen demands that work of this type throws up. However we may try, we cannot, thank goodness, foresee every eventuality.