

Plastics in Schools: The Role of ESPI

Why Plastics?

The emphasis in both primary and secondary education is to make pupils more aware of technology and prepare them for the technological society they will enter upon leaving school. Whilst most people concerned with school-based education see a technological society as one in which electronics and computers will play an increasing role, this blithe attitude ignores the manner in which plastics as a material is, even now, used in a very wide range of products.

Plastics are much more than polythene washing-up bowls and PVC rainwear; their uses embrace composite helicopter blades, components for heart surgery, and coatings which have made space exploration possible. In terms of volume production, polymers now outstrip ferrous metal and their growth rate is still evident in spite of an economic depression. Current research points to the

all-plastic car engine in the next decade; and even if the oil runs out, plastics can be derived from oil substances. The present can be seen as the dawn of the electronics age; but this may be a misnomer, it would appear in the foreseeable future, electronics will rely heavily on plastics for insulation and encapsulation. Are we not really on the threshold of the 'Plastics Age', and to deny children an opportunity to study plastics is to make them unprepared for a vital part of the next century.

Where the study of plastics is introduced into school technology, it is essential to explain their properties in relation to other materials, as this leads on to an appreciation of applications. It is incorrect selection of specific plastics for inappropriate end-uses which has, in the past, resulted in some plastics failing when in use. An awareness of the correct application of plastics can be seen as straightforward 'consumer education';

Below: Some of the titles available in the ESPI Topic Guide series.



but within a technology syllabus, such an exercise should be interpreted as an arm of 'materials science'.

A Starting Point

The manipulation and fabrication of plastics has been covered adequately in many texts,¹ it is sufficient to say that much work with plastics can be done with conventional hand tools and very simple testing equipment. As plastics work develops in a school, the purchase of specialist equipment may be necessary for certain processes. Whilst ESPI is not in a position to assess and recommend equipment and materials suppliers, the Service has compiled a 60 page booklet² which lists all audio-visual and processing equipment which relates to the teaching of plastics. In addition to this booklet, ESPI has developed a postal enquiry service (dealing with over 6000 enquiries per annum) which answers specific questions from teachers, pupils, and careers personnel.

Exhibiting and Conferring

Answering a large volume of postal enquiries gives an insight into the type of problems faced by teachers in their day-to-day teaching, while enquiries from pupils often suggest the type of project being set and the trail of investigation being followed. In producing its first Topic Guide³ four years ago, ESPI began a series of Guides⁴ which can be adapted for lesson preparation or used by pupils as project material. Each Guide relates to the volume of enquiries received on a specific topic and is, therefore, satisfying a known need. Produced in duplicated A4 format, with an average 60 pages, the Guides are regularly revised to ensure all information is correct and up to date. If postal enquiries can be seen as conferring at arms' length, the regular attendance at educational conferences and exhibitions means face-to-face contact with teachers and advisers. Visits are also made to industry and schools to keep abreast of developments.

Other Support for Teachers

The combining of 40 plastics samples, all the literature produced by ESPI and trade literature into a Plastics Resource Box, has produced a multi-purpose teaching aid which has been used in many educational settings — from polytechnics to primary schools. The resources within the box fully explain plastics, allowing the teacher to adapt the contents to specific ages and abilities. The box is so designed that the contents can also act as a display of plastics types, processing and applications.

There has long been a need to show technology teachers the contribution plastics can make to their teaching. ESPI has now produced a tape-slide sequence which not only explains the evolution, nature and applications of plastics, the also sequence incorporates much original school work which presents ideas for further development. There

are 80 slides in the complete sequence, arranged in 4 thematic groups of 20.⁵

Whenever the matter of plastics usage in schools is discussed at length, the question of safety is always raised. To help further the cause of safety, ESPI has a series of 4 safety posters for display in schools⁶ and a series of 8 safety workcards (with answers) for use by pupils.⁷

Future Teaching Aids

Having developed much for the CDT specialist, ESPI is now developing a Foundation Text for science teachers, covering simple experiments, identification, processing and the applications of plastics. This text is intended for CSE stream pupils, although the text contains material readily adapted for GCE entrants. A text on PVC technology which covers those 'A' level syllabi emphasising Industrial Chemistry will soon be published.

The science texts mentioned will be available by mid-1985 with a Guide on Plastics in Road Transport to follow later. Work has commenced on material suitable for TVEI teaching to integrate CDT and Business Studies.

These are the titles which will be produced in the short-term; others are planned to meet traditional curricular and the more radical changes in education which are currently taking place.

Careers

If the proposition that the expansion of plastics applications is sufficient reason to teach the subject in schools, then this same argument holds up when discussing careers in plastics. The teaching of Technology and Design and Materials Science in schools can lead the pupils smoothly into a career in plastics which is very wide ranging — be it in research, marketing, production, or design.

References

1. ESPI 'Books for the Study of Plastics in Schools'.
2. 'Aids to Teach Plastics'.
3. 'GRP Laminates'.
4. 'GRP Laminates'
'Plastics in Contact with Food'
'Plastics in Agriculture and Horticulture'
'Plastics in Furniture'
'Plastics all Around Us'
'Plastics: Facts and Figures'
'Plastics in Building'
5. 'Plastics in CDT' Tape/slide set available for copying.
6. Safety Posters — available singly or as set
'Plastics in the Workshop'
'Safe Handling'
'Protecting Yourself'
'Constructing Safely'
7. Safety Workcards — set of 8 using puzzle-solving approach 'Signposts to Safety' each with different theme.