

Terms of Reference of the Design and Technology Working Group National Curriculum

Department of Education and Science

Background

1. The Education Reform Bill currently before Parliament provides for the establishment of a National Curriculum of core and other foundation subjects for pupils of compulsory school age in England and Wales. For most subjects, including technology, the Government wishes to establish clear objectives — attainment targets — for the knowledge, skills, and understanding which pupils of different abilities and maturities should be expected to have acquired by the end of the academic year in which they reach the ages of 7, 11, 14 and 16; and to promote them, programmes of study describing the content, skills and processes which need to be covered during each key stage of compulsory education. Taken together, the attainment targets and programmes of study will provide the basis for assessing a pupil's performance, in relation both to expected attainment and to the next steps needed for the pupil's development.

2. Both the objectives (attainment targets) and means of achieving them (programmes of study) should leave scope for teachers to use their professional talents and skills to develop their own schemes of work, within a set framework which is known to all. *It is the task of the Working Group on Design and Technology to advise on that framework for design and technology.*

The Task

3. The science working group is already looking at attainment targets and programmes of study for primary technology. The Design and Technology group should focus on the final two key stages, as defined in the Education Reform Bill — ie the secondary phase — building on the work of the science group for the primary phase.

4. The Working Group is asked to submit an interim report to the Secretaries of State by 31 October 1988 outlining:

- i) the contribution which design and technology should make to the overall school curriculum and how that will inform the Group's thinking about attainment targets and programmes of study;
- ii) its provisional thinking about the knowledge, skills and understanding which pupils of

different abilities and maturities should be expected to have attained and be able to demonstrate at key ages;

- iii) its thinking about the programmes of study which would be consistent with the attainment targets provisionally identified.

5. By 30 April 1989 the working group is to submit a final report to the Secretaries of State setting out and justifying its final recommendations on attainment targets and the programmes of study for design and technology. In addition, the Working Group should recommend attainment targets and programmes of study for design and for information technology in the first two key stages, for primary pupils, to supplement the recommendation of the science working group.

Approach

6. In approaching its task the working group is to view technology as that area of the curriculum in which pupils design and make useful objects or systems, thus developing their ability to solve practical problems. The working group should assume that pupils will draw on knowledge and skills from a range of subject areas, but always involving science or mathematics. They should be taught the principles and practice of good design, the application of theoretical knowledge, and within that context the practical craft skills needed for realising their designs in wood, metal, plastics, textiles and other materials. They should also learn about the variety of modern materials and technologies in use in the world of work by learning how to work in teams as well as by themselves; by understanding the importance of functional efficiency, quality, appearance and marketability; and about the importance of working within financial and technical constraints. Modern business practice increasingly involves the use of IT. Technological education should equip pupils with basic IT skills and develop an awareness of the potential use of IT and computer technology whether in the business office, or manufacturing or commerce.

7. Technology as described above is an activity which goes 'across the curriculum', drawing on and linking in with a wide range of subjects. The group

should start from the basis that technology is an area of study in its own right, with its own distinctive objectives and content. This does not necessarily mean that technology must be a separately timetabled subject: schools will be free to teach technology how they choose, provided that the activity is coordinated as a clear programme and directed towards the distinctive objectives of technology. By the end of the third key stage of their compulsory education pupils should have acquired a firm basis of skills, knowledge and understanding in technology. This will provide a broad foundation on which pupils can build in undertaking technological work as defined in paragraph 6 in more specialised contexts, including other subject areas during the fourth key stage, whether for GCSE or otherwise.

8. Design will be an essential part of technology as defined above, but will also draw on and contribute to other areas of the curriculum. The Working Group is asked to consider design in all its aspects throughout the period of compulsory education, identifying and recommending attainment targets for those of particular importance in technology and recommending a framework within which other aspects will need to be developed in other subjects. The group should work on the basis that the distinctive objectives of design and technology are that a pupil at the end of his or her compulsory education, should:

- i) be able to design and make artefacts and systems, applying scientific or mathematical and other knowledge and skills;
- ii) be familiar with designing processes and have had experience of applying them to real life tasks within typical constraints (time, money etc) with due regard to cost, marketability, social, environmental and other relevant factors;
- iii) appreciate the importance of design and technology in society, historically and present day, particularly as it affects the economy.

9. The use of computer and information technology and other advance technologies in control, simulation and data storage and retrieval is becoming

increasingly important in our society. This fact should be reflected in the use of computer and information technology across the school curriculum. Each subject group as it is set up is being asked to consider the scope for using computer and information technology in its subject and to frame appropriate attainment targets. However, the design and technology group is asked to provide within the national curriculum a focus for the development of computer and IT awareness, and skills such as keyboard skills and basic programming, by recommending appropriate attainment targets at the four key stages together with a supporting programme of study related to IT and basic computer skills and to awareness of the uses of advanced technology.

10. In carrying out its work the group should consult informally and selectively with relevant interests including industry and have regard to the work of other subject groups, particularly the work of the science group on primary technology. Additionally the group should take account of

- i) the broad framework proposed by TGAT for assessment and testing;
- ii) the contributions which design and technology can make to learning about other subjects, and other subjects can make to learning about design and technology.
- iii) best practice and the results of any relevant research and development, and particular developments under TVEI.

and the issues covered in the supplementary guidance to the Group's Chairman.

Supplementary guidance to the Chairman of the Design and Technology Working Group

1. This note amplifies some of the points outlined in your terms of reference.

Attainment Targets and differentiation

2. The attainment targets are expected to provide specific enough objectives for pupils, teachers, parents and others to have a clear idea of what is expected and to provide a sound basis for assessment and testing. They should allow scope for

the very able, those of average ability, and the less able to show what they know and can do. It should not be necessary to have different attainment targets for children of different abilities. The targets should be capable of assessment at a range of levels and challenge each child to do the best that he or she can. Attainment targets should be sufficiently challenging at all levels to raise expectations, particularly of pupils of middling achievement, as well as stretching and stimulating the most able. The working group should give particular thought to the application of attainment targets to lower attaining pupils and those with special educational needs. In advising on attainment targets in design and technology, the working group should attempt to cover all areas of the subject and justify fully any recommendation that specific targets are not appropriate for particular aspects.

Programmes of Study

3. The programmes of study should provide a detailed description of the content, skills and processes which all pupils need to be taught so that they can develop the knowledge and understanding they will need to progress through school and eventually to adult life and employment. This detailed description needs to be set within an outline or overall map of the design and technology curriculum which takes account of what may be expected of pupils of different abilities.

4. Within the overall programme of study, however, there should be space to accommodate the enterprise of teachers, offering them sufficient flexibility in the choice of content to adapt what they teach to the needs of the individual pupil.

5. The development of attainment targets and programmes of study is likely to be an iterative process. Some consideration of content will probably come into the working group's thinking about attainment targets. It will also be necessary to take into account the general objectives and the contribution of design and technology to the overall curriculum.

Special Needs

6. The Government proposes that where a pupil has a statement of special needs

under the 1981 Education Act, the statement should specify any national curriculum requirements which should not apply or should be modified for the individual pupil. In addition, orders will define the circumstances in which the application of the national curriculum provisions to individual pupils might be modified or disapplied for any foundation subject. For example, the modern language orders might indicate that pupils with severe difficulties in English should be introduced to a foreign language later than or on a different basis for most children. Any comparable adaptations which could be justified in the case of design and technology should be considered by the working group.

Links with other subjects

7. By its nature technology has links with subjects across the curriculum. Science and technology are intimately linked at secondary as well as primary level and their teaching needs to be properly coordinated. Scientific concepts and knowledge relating to materials, energy and power are particularly relevant to technology. The working group should where appropriate link its recommendations with those of the science working group so that they complement rather than duplicate one another.

8. The working group should also take account of the possibilities of links with other relevant subjects such as art, home economics and business studies. It should consider how and to what extent the design and technology programmes of study should draw on these subject areas. For the fourth key stage the working group should advise on central design and technology attainment targets which might be pursued either on a single subject basis or through other subjects, and which could form the basis of more developed technological work in those subject areas.

9. There are a number of important subjects, themes and skills which can be taught and developed through foundation subjects. The working group has a specific remit in relation to design. It should also consider the contribution of technology to other themes such as economic awareness and environmental awareness. The working group should also cover the technological aspects of

health and safety education both in the workshop and outside the school. All subjects should promote the development of good written English and numeracy.

Ages and Stages; Time Allocations

10. The working group should assume that all pupils, other than those with statements of special need under the Education Act 1981 which specify otherwise, will study technology throughout their compulsory schooling and the majority are likely to take a GCSE in technology or a subject which will involve a substantial element of technology approved against relevant GCSE criteria.

11. In framing its recommendations the working group should assume that on average the equivalent of some 2-4 periods of a 40 period timetable is available for technology for years 1-3 of secondary school. Beyond that stage the amount of time required will depend upon the extent to which the attainment targets and programmes of study are pursued through other subjects. The group should assume that, for a pupil in years 4 and 5 of secondary school, the technology core element, and any technological component developed in other subject areas, would each take up on average 2 timetable periods.

Assessment and Examinations

12. Attainment targets will provide objectives against which pupils' progress and performance can be assessed. The main purpose of such assessment will be to show what a pupil has learnt and mastered, so as to enable teachers and parents to ensure that he or she is making adequate progress and to inform decisions about the next step.

13. The main focus of the group's work will be on attainment targets and programmes of study. However, it should take account of the broad

framework of the Report of the Task Group on Assessment and Testing which included recommendations for the work of subject groups, and in particular should offer advice in broad terms about assessment and testing in relation to the attainment targets recommended, and what might appropriately be measured by nationally prescribed tests.

GCSE

14. Not all pupils will take GCSE examinations in technology as such. However, in defining attainment targets and programmes of study the working group should take account of the GCSE National Criteria for CDT and other subjects with a technological element so far as these are consistent with the approach in the terms of reference. It will want also to take note of the Secondary Examination Council's work on making GCSE grades more objective: the report of the grade criteria working parties may be a source of ideas as may the individual GCSE syllabuses developed under the CDT, General or other Subject Criteria where there is a technological element. The School Examinations and Assessment Council will be asked to advise on revised GCSE criteria to reflect the national curriculum attainment targets and programmes of study for ages 14-16 and to approve syllabuses accordingly.

General Principles

15. Generally in framing recommendations, the Group should consider the need for — continuity and progression throughout the period of compulsory schooling and beyond — breadth and balance — relevance: the content and teaching of the various elements of the national curriculum should bring out their relevance to and links with pupils' own experience and background and their

practical application and continuing value to adult and working life — all elements of the curriculum to contribute to the development of general personal qualities and competences in young people which will be of value to them in adult and working life — for example, self-reliance, self-discipline, a spirit of enterprise, a sense of social responsibility, the ability to work harmoniously with others, an ability to apply knowledge and use it to solve practical real life problems.

16. It will also be important to bear in mind that the curriculum should provide equal opportunities for boys and girls; and to consider, in this context, the expectations and attitudes of girls to design and technology. The Group should also take account of the ethnic and cultural diversity of the school population and society at large.

Implementation

17. The Government intends to make an Order relating to attainment targets and programmes of study in design and technology for secondary pupils by the end of 1989 following wide consultation through the proposed National Curriculum Council. On this timetable, schools may expect to begin implementing this Order at the start of the academic year 1990 —

91. The working group should advise whether the Order should be brought in on a phased basis rather than for all children at once.

18. In carrying forward its work the group may find it useful to take account of good practice in technological education as defined in the terms of reference and developed in individual schools and by LEAs. It may also wish to draw on the collective wisdom of the professional bodies and those organisations outside the world of education who have an interest in design and technology in schools.