

PREM 19/2643

Part 20

Confidential File

General Policy on Education

EDUCATION

Part 1: May 1979

Part 20: Dec 1988

attached: Ring Binders entitled Maths and Science in the National Curriculum,
(Folder: HISTORY + GCSE HISTORY; ERRORS & EVILS ^{THE} OF NEW HISTORY; HISTORY IN PERIL.)

Referred to	Date	Referred to	Date	Referred to	Date	Referred to	Date
5.12.87							
12.12.87							
12.12.88							
14.12.88							
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13.3.89							
15.3.89							
23.3.89							
Part 20 ends							

PREM 19/2643

PART 20 ends:-

PG to BG 23. 3. 89.

PART 21 begins:-

BG to PM 3. 4. 89

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PROFESSOR GRIFFITHS

NATIONAL CURRICULUM GEOGRAPHY WORKING GROUP

Ken Baker's threatened minute eventually came in at 3.30 this afternoon. It has already been copied to you.

I have told Tom Jeffery that, given this time of arrival, they will not be able to have a reply until after the Easter holidays. But I have promised to try to put it in the Box on the evening of Monday 3 April, so that DES can have a response the next day. Could you therefore please let me have any thoughts both on the proposed names and the terms of reference and supplementary guidance on 3 April.

PAUL GRAY
23 March 1989

EL3DKX



A *ccp*

PRIME MINISTER

NATIONAL CURRICULUM GEOGRAPHY WORKING GROUP

With your agreement I announced on 13 January the timetable for further work on the National Curriculum. We made clear our intention to establish the Geography Working Group this Easter, so that implementation of requirements for geography can start in schools in the Autumn of 1991.

Peter Walker and I hope to be able to announce the establishment of the Group soon after Parliament reassembles.

I now attach proposed terms of reference and supplementary guidance for the Working Group. The guidance emphasises the need for pupils to have a good knowledge of the geography of Britain as well as of more distant places. It also stresses the central contribution which geography must make to education about the environment.

I have not yet started to interview candidates for membership of the Working Group, but I have in mind three possibilities for its chairman: Sir Leslie Fielding, Vice-Chancellor of Sussex University; Professor Colin Renfrew, Master of Jesus College, Cambridge; and Professor David Thomas, of the University of Birmingham. Brief details of these people are set out annexed to this minute. I had thought of Sir Brien Cartledge, who as you know was our Ambassador in Moscow until 1988 and is now Principal of Linacre College, Oxford, but I understand that he is too busy to take on such an appointment.

My preferred candidate, subject to your views, is Sir Leslie Fielding. If he is unable to take on the work, I should next want to approach Professor Renfrew. If either of these is appointed Chairman, I shall want to ask Professor Thomas to be Vice-Chairman. I should be grateful to know if you are content with these proposals.

I am sending copies of this minute to Peter Walker, Douglas Hurd, Norman Fowler, David Young, Nicholas Ridley, Malcolm Rifkind, Tom King and to Sir Robin Butler.

KS

KB

DEPARTMENT OF EDUCATION AND SCIENCE

23 March 1989

GEOGRAPHY WORKING GROUP
POTENTIAL CHAIRMEN

Sir Leslie Fielding (56)


Vice-Chancellor, University of Sussex since 1987. Diplomat 1956-73, serving in Tehran, Phnom Penh and Paris. Service with European Commission 1973-87: head of delegation in Tokyo 1978-82; Director-General for External Relations 1982-87. Has proved an effective and enthusiastic Vice-Chancellor.

Professor Colin Renfrew (51)

Master of Jesus College, Cambridge since 1986. Professor of Archaeology at Southampton 1972-81; at Cambridge since 1981. Distinguished in the fields of archaeology and ancient history; writer and broadcaster on these subjects, including both scholarly and more popular works.

Professor David Thomas (57)

Pro-Vice Chancellor and Head of Department of Geography at the University of Birmingham. Formerly Professor of Geography, St David's University College, University of Wales. Regarded as a first class geographer and has written books and articles on a number of subjects including agriculture and Green Belts. Was until recently chairman of the Secondary Examinations Council's 18+ Committee and was well-regarded in that capacity.



TERMS OF REFERENCE

Background

1. The Education Reform Act 1988 provides for the establishment of a National Curriculum of core and other foundation subjects for pupils of compulsory school age in England and Wales. The Act empowers the Secretary of State to specify, as he considers appropriate for each foundation subject, including geography, that there should be 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) divided into up to 10 levels of attainment 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 statutory framework which is known to all. It is the task of the Working Group on Geography to advise on that framework for geography.

The Task

3. The Working Group is asked to submit an interim report to the Secretaries of State by 31 October 1989 outlining and, as far as possible, exemplifying:

- i) the contribution which geography 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 by reference to defined levels of attainment, at key ages; and the profile components into which attainment targets should be grouped; and
- iii) its thinking about the programmes of study which would be consistent with the attainment targets provisionally identified.

4. By Easter 1990 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 geography.

Approach

5. In carrying out its task the Group should consult informally and selectively with relevant interests and have regard to the work of other subject groups, in particular those on Science, mathematics, design and technology and history. Additionally the Group should take account of:

- i) the broad framework for assessment and testing announced by the Government on 7 June 1988 and subsequent development of it in the light of advice from the School Examinations and Assessment Council;
- ii) the contributions which geography can make to learning about other subjects and cross-curricular themes including, in particular, environmental education, and which they in turn can make to learning in geography;
- iii) best practice and the results of any relevant research and development; and
- iv) the issues covered in the supplementary guidance to the Group's Chairman.

SUPPLEMENTARY GUIDANCE TO THE CHAIRMAN OF THE GEOGRAPHY WORKING GROUP

1. This note amplifies some of the points outlined in the Working Group's terms of reference.

Attainment Targets, levels of attainment and differentiation

2. The attainment targets are expected to provide specific objectives so that pupils, teachers, parents and others 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. To this end, each target should be divided into up to 10 levels of attainment by reference to which pupils may demonstrate both progress over time and differences in ability. It should not be necessary to have different attainment targets for children of different abilities. The targets at each level should be capable of assessment and challenge each child to do the best that he or she can. They should raise expectations, particularly of pupils of middling and lower ability, 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, the Working Group should attempt to cover all areas of geography and justify fully any recommendation that specific targets are not appropriate for particular aspects, or that an attainment target should not apply to all 10 levels of attainment.

Programmes of Study

3. The programmes of study should provide a description of the content and processes which all pupils need to be taught so that they can develop the knowledge, understanding and skills to progress through school and eventually to adult life and employment. The programmes of study should be related to each level within an attainment target.

4. The study of geography in schools should enable pupils to develop a sense of place, an understanding of the relationships between places and an appreciation of the value of maps. It should create a framework of knowledge and understanding about pupils' home areas and about other places within Great Britain. It should be related to wider perspectives - of the world as a whole, its continents and oceans, and the place of Britain and Europe within it - so that pupils are able to put information and experience in a geographical context. Overall, it should enable pupils to develop an informed appreciation and understanding of the world in which they live.

5. Geography should foster pupils' understanding of, and respect for, natural environments. Pupils should learn how physical conditions such as climate and natural resources both influence human activities and are affected by them. Geography should also help pupils to gain a knowledge of ways of life and cultures other than their own and to understand and appreciate

the similarities and differences. It should also help them to understand the physical, economic, political and cultural relationships that link peoples living in different places throughout the world.

6. The study of geography should give due weight to the physical processes and human actions that bring about changes on the Earth's surface and the ways in which these changes may affect peoples' lives. It should lead pupils to examine and understand the ways in which people use the earth and its resources in making their living and seeking to improve the quality of their lives. Particular attention should be given to the impact of human activities on environments and the real costs and benefits of different activities.

7. The programmes of study in geography should reflect the emphasis which must be given at each key stage to the content of geographical knowledge and should lay the foundation for the progressive development of the skills and processes of geographical enquiry. This means collecting, analysing, interpreting and reporting evidence obtained both at first hand - including through pupils' own experiences of travel - and from secondary sources such as maps, books, photographs, satellite images, diagrams and statistics. They should allow for appropriate use to be made of material drawn from the local area. At the same time, the Working Group should consider the contribution field study can make in providing geographical experience for pupils of different ages. Above all, the programmes of study should reveal to pupils that geography is interesting, exciting and enjoyable as well as having direct application in their daily lives.

Special Needs

8. The Education Reform Act 1988 provides that where a pupil has a statement of special educational needs under the 1981 Education Act, the statement should specify any National Curriculum requirements, including assessment arrangements, which should not apply or should be modified for that individual pupil. In addition, Orders or regulations under the 1988 Act can define the cases or circumstances in which the application of the National Curriculum provisions may be modified or disapplied for any foundation subject. The Working Group should consider and advise on whether any such adaptations would be appropriate and justified in the case of geography.

Links with other subjects

9. By its nature, geography has links with many subjects across the curriculum. To an extent which is unique among the core and other foundation subjects, the content of geography and the techniques and methods it uses extend across the arts and the sciences. Geography can therefore contribute to learning in other subjects in a distinctive practical and interesting way while being itself promoted by work in those fields. There are clear links, particularly, with science, mathematics, design and technology, including information technology, and history. In the case of mathematics and science, the Working Group should identify any overlap of interests with the attainment targets and

programmes of study that have been established. The Working Group's task is to impart a distinctively geographical dimension to learning in the areas concerned. The Group's attention is drawn particularly to science AT2 (the variety of life), AT5 (human influences on the Earth), AT6 (types and uses of materials), AT9 (Earth and atmosphere), AT13 (energy), and AT16 (the Earth in space). Geography also has links with cross-curricular matters such as economic and political understanding, and bears a heavy responsibility for environmental education and the European dimension in education both of which are the subject of Resolutions of the Council of Ministers of the EC to which the UK is a party. The Working Group should take these and other reciprocal connections into account in its recommendations for attainment targets, programmes of study and related assessment arrangements for geography, bearing in mind in particular that all subjects should promote the development of good written English and numeracy. The overriding consideration should be that clear attainment targets and programmes of study are set for geography so as to ensure progression and coherence in what is taught.

Ages and Stages; Time Allocations

10. The Working Group should assume that all pupils, other than any whose statement of special educational needs under the Education Act 1981 specifies otherwise, will study geography throughout their compulsory schooling and many are likely to take a GCSE in geography or a subject which will involve a substantial element of geography approved against relevant GCSE criteria.

11. In framing its recommendations the Working Group should assume that in England normally the equivalent of some 3-4 periods of a 40 period weekly timetable will be available for geography during years 1-9 (ie normally primary school and years 1-3 of secondary school); the Group should not however assume that timetables will be thus organised in 40 period weeks, nor that they will be based on tuition every week in geography. Beyond the 9th year - ie for a pupils in years 4 and 5 of secondary school - the amount of time required will depend upon whether a GCSE or equivalent examination course in geography is being followed. Where it is, the Group should assume, on average the equivalent of 4 periods in a 40 period week. For other courses, including non-examination courses, the Group should assume that on average the equivalent of 2 periods a week will be available for geography; the essential requirement is that the geography studied should provide for worthwhile progress beyond what has already been achieved at the end of key stage three. For pupils in Wales, the Group should assume that geography should continue to occupy the time typically available for the subject at present in schools in Wales. For Key Stage 3 this should be taken as the equivalent of two periods in a 40 period weekly timetable. For Key Stage 4, the Secretary of State for Wales would wish the full range of attainment targets and programmes of study to be available to pupils in Wales on the same two bases as in England. The Group should take advice from appropriate organisations in Wales about the degree to which it might be necessary for attainment targets and programmes of study to differ in Wales.

Assessment

12. Attainment targets and more specifically the statement of attainment associated with each attainment level, 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 steps. The targets, and the associated statements of attainment for each level, should therefore be sufficiently clearly specified so that they are capable of assessment and each conveys a unique description of the required attainment regardless of the age at which a level is reached. The group should also indicate the range of attainment, as reflected in the statements of attainment it recommends for each level, with might be expected of pupils of different abilities and maturities during each of the 4 key stages.

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 for assessment and testing announced by the Government on 7 June 1988 in response to the reports of the Task Group on Assessment and Testing which included recommendations for the work of subject groups. In particular the Working Group should offer advice in broad terms about assessment and testing in relation to the attainment targets recommended, the grouping of those targets into profile components for purposes of reporting the results of assessment, appropriate methods of assessment and testing for the attainment targets it recommends, and in particular what might appropriately be measured by nationally prescribed tests including written tests.

GCSE

14. Not all pupils will take GCSE examinations in geography as such. However, in defining attainment targets and programmes of study the Working Group should take account of the GCSE National Criteria for geography so far as these are consistent with the approach in the terms of reference. The School Examinations and Assessment Council will be asked to advise on whether, and if so how, the GCSE criteria need to be revised 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 be important to bear in mind that the curriculum should provide equal opportunities for boys and girls. The Group should also take account of the ethnic diversity of the school population and society at large. Further guidance will be given on particular points to be considered in order to avoid unnecessary difficulties for children with special educational needs.

Wales

17. The Group will need to bear in mind that the Secretary of State for Wales wishes them to recommend a framework of attainment targets and programmes of study which would be usable, with the necessary adaptation, in Wales.

Implementation

18. The Government has made Orders under the 1988 Act requiring the core and other foundation subjects, including geography, to be taught from Autumn 1989 to most pupils for a reasonable time in each of the first three key stages (i.e. years 1-9). For pupils with statements of special educational needs the requirement will be introduced from Autumn 1990. Pupils in the fourth key stage (years 10-11) will have the requirement extended to them at a later date.

19. Statutory attainment targets and programmes of study are likely to be introduced from Autumn 1991, starting with key stages 1 and 3.

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PROFESSOR GRIFFITHS

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NATIONAL CURRICULUM: ENGLISH

I put these papers to the Prime Minister last night. You will see from the note on my covering minute (attached) that she decided not to do battle with DES on this issue.

Paul Gray

15 March 1989



File No

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

15 March 1989

NATIONAL CURRICULUM: ENGLISH

The Prime Minister was grateful for your Secretary of State's minute of 10 March and the enclosed revised versions of the attainment targets and programmes of study for 5-7 year olds. She is content for him to proceed as he proposes.

Paul Gray

Tom Jeffery, Esq.,
Department of Education and Science.

man

Committee of Vice-Chancellors and Principals
of the Universities of the United Kingdom

29 Tavistock Square London WC1H 9EZ Telephone 01-387 9231

From the Chairman: Professor Sir Mark Richmond FRS

In reply please quote: MHR/JD

14th March 1989

Dear Prime Minister, ^④

On behalf of my colleagues and myself, I'd like to thank you very much for the opportunity to meet yesterday afternoon. I know all the Vice-Chancellors present found it a most useful occasion.

We would now propose to pursue the various topics that arose with Kenneth Baker and Henry Chilver, as appropriate.

Yours sincerely

Mark Richmond

The Rt. Hon. Margaret Thatcher, M.P.,
Prime Minister,
No. 10 Downing Street,
London.

14 March 1989

R
B

NATIONAL CURRICULUM: ENGLISH

- Last year the National Curriculum English Working Group (chaired by Professor Cox) published their Report for attainment targets and programmes of study for the primary years.
- Kenneth Baker then published his proposals based on this report, which he sent for consultation to the National Curriculum Council; in doing so he emphasised the importance of children being taught grammar.
- Earlier this month the NCC sent back to him a revised draft which placed less emphasis on grammar.
- The latest document from the Secretary of State is his revision of the NCC's Consultation Report, which he proposes should now be published and a draft statutory order.

This may seem a pointless game of ping-pong. It is not. Only by ensuring that the details are right will standards of reading, writing and speaking be improved.

The document from the Secretary of State however needs to be strengthened to show that:

- (a) the purpose of a national curriculum in English is to teach all students the use and structure of Standard English, and that,
- (b) children should expect to learn primarily from being taught by teachers and not by other children.

have gone through the text from Kenneth attempting to strengthen his revision wherever possible. The following is the detailed responses.

Suggested Revisions: Attainment Targets

- At Target 2 Level 3(i)

Add after comma, but before eg, "thereby demonstrating understanding".

- At Target 2 Level 3(v)

Delete "Begin to".

- At Target 3 Level 3(v)

The example here is important and should be included "Final drafted versions of writing should be demonstrably more fluently written and grammatically punctuated".

Also add Level 3 (vi)

"Begin to use tenses consistently and appropriately"

- At Target 4 Level 2 (i)

Delete "Though not necessarily always correct".

Suggested Revision: Programmes of Study

- At Target 1
para 6.4(iii)

Delete "most of the children"

- At Target 2
para 7 line 2

Add after legends "of the English literary heritage"

para 8 Delete

para 9(v) Delete "and each other"

para 9(viii) Replace "talk" by "be taught"

- At Targets 3, 4 and 5

para 13 Omit "or play write in" and replace by "about"
Delete "Early play writing should be encouraged and respected".

para 14 Delete third sentence and replace by

"Such knowledge about language can serve to help fluency in both languages and the aim of the English programme is universal competence in Standard English for all pupils".

para 22, second sentence

Replace by "Pupils should be taught correct spelling and punctuation of the English language eg letter, capital letters, full stop, question mark".

Louise Ashton
for/

BRIAN GRIFFITHS

PRIME MINISTER

NATIONAL CURRICULUM

Kenneth Baker's minute (Flag A) seeks your agreement to publishing this week draft attainment targets and progress for study for 5-7 year olds. His proposals involve substantial strengthening of NCC's recommendations.

However, Brian Griffiths (Flag B) feels Kenneth Baker's changes do not go quite far enough. He makes some further specific suggestions, which I have transcribed in red on to Kenneth Baker's draft at Flag A.

My understanding is Kenneth Baker thinks he has gone a long way to tighten up the NCC proposals. But you will want to consider whether you wish him also to take on Brian's further comments.

Content with Kenneth Baker's draft?

Or do you also wish him to take on some or all of Brian's comments?

PP

Dis/less

PAUL GRAY

14 MARCH 1989

Although I think Brian is right - especially about children learning for teachers rather than other children - I don't think it would be wise to press Kenneth Baker any further. We must save our zeal for the next set of papers.

mb

MRMALB

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Meeting
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SUBJECT
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10 DOWNING STREET
LONDON SW1A 2AA

From the Principal Private Secretary

13 March 1989

Dear Tom,

MEETING WITH UNIVERSITY VICE CHANCELLORS

The Prime Minister held a meeting today with a group of university Vice-Chancellors. Present were Sir Mark Richmond, University of Manchester and Chairman of the Committee of Vice Chancellors and Principals, Sir Patrick Neill, Oxford University, Lord Flowers of London University, Sir John Kingman, Bristol University, Professor Graeme Davies, Liverpool University and Dr. Ewan Page, Reading University. Also present were Lord Chilver and Sir Peter Swinnerton-Dyer. Your Secretary of State, Mr. Jackson and Professor Griffiths were also present.

Sir Mark Richmond opened the discussion by saying that a great deal had been achieved in the universities; attitudes of mind as well as structures had been changed. The universities and Government were now at a watershed where it was necessary to decide whether to continue with a centrally directed system or to move in a new direction in which the universities responded to a diversity of influences. There was general agreement on the need to increase access to the universities. It was necessary to decide the extent to which the resourcing of universities reflected the preferences of Government, students or employers.

In discussion it was noted that all three would exert an influence though that of Government should be less than in the past. A system in which student preferences dominated would be unlikely to generate the mathematicians and scientists the country needed; one based solely on employer preferences was likely to reflect short-term views. The Prime Minister saw the universities as providing education in a number of basic subjects with the flexibility operating at the margin.

Sir John Kingman said that wider access had to be achieved subject to a number of constraints. There should be no reduction in quality. Degrees should, for the most part, be achieved in three years and the wastage rate should be kept low. Public funding would inevitably be constrained and would therefore need to be deployed in the most effective way. In his view, this meant moving away from flat rate subsidies. He advocated greater competition between universities.

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The Prime Minister questioned whether the universities were now more ready to adapt to change. Professor Davies said this was so and was supported by Lord Flowers. Both thought that changes were now being made which would have been unthinkable five years ago. Lord Flowers made a plea for a reduction in the bureaucratic detail universities had been subjected to by the UGC. He hoped that, with the change from UGC to UFC, it would be possible for clear objectives to be agreed with the universities about access, about the subject mix and about the basis of funding. This would provide a framework within which the universities could make their own plans, including the need to raise money from sources other than Government. Sir Peter Swinnerton-Dyer defended the role of the UGC. Regrettably not all the universities were well run and much of the UGC's detailed supervision had been necessary to prevent some universities from getting into difficulties. It had also been the case that the very lengthy research submissions which universities had made had come about as a reaction to the shorter submissions which the UGC had originally sought. The Prime Minister commented that the Government was accountable to the PAC and that while the universities remained more dependent upon Government funds than, for example, in the US it was inevitable accountability would have to be operated in a detailed way. Nevertheless it should be an objective of the new UFC to cut down bureaucracy as much as possible.

The Secretary of State for Education and Science asked whether the universities favoured the public fee element playing a larger role. Sir Mark Richmond said that in general they did. He also welcomed the rise in employer sponsorship which was moving the structure of funding in a helpful direction. Sir Mark said that the universities were looking for a statement from Government that the universities were playing a vital role at the centre of education. The Prime Minister replied that this was so obvious as not to need saying. Sir Mark replied that, regrettably, this was not accepted by many people working in the universities.

The Prime Minister said that the very low student/teacher ratio in British universities provided substantial scope for greater access out of existing resources. Sir John Kingman pointed out that in those countries with higher ratios, teachers were not expected to undertake so much research nor were degrees generally completed in three years. The Secretary of State for Education and Science asked whether it was now accepted that salaries had to be more differentiated. Sir Patrick Neill said that Oxford University was working on plans for a business school. It had been advised that this could only be staffed by recruiting from what was, in effect, an international market, paying international rates. Greater differentiation, though opposed by many university lecturers was inevitable and would spread to other subjects.

Lord Flowers expressed his fear that IRC's would reinforce the dominance of large structures. The Prime Minister strongly agreed that adequate provision should continue to be made for smaller research teams.

The discussion then turned to private fees. Sir Mark Richmond said opinions within the group were divided. Sir John Kingman, who was strongly in favour of greater differentiation between fees for different subjects handed the Prime Minister the attached note setting out his own blue print. Lord Flowers regarded differentiation of fees between subjects and between people according to their means as something which was bound to come.

Summing up the discussion, the Prime Minister said there was a large measure of agreement that a great deal had already been achieved in the universities but that if access was to be widened there needed to be a change in the balance of funding of the universities away from Government. This would change the relationship between universities and Government for the better. It was agreed that in response to any press enquiries it should be stated that there had been helpful discussions on a wide range of issues. These had been forward looking and had not touched on current issues of pay or funding.

I am copying this letter to the Private Secretary to the Parliamentary Under Secretary of State (Department of Education and Science) and to Sir Robin Butler.

After the Vice-Chancellors had left, your Secretary of State urged the Prime Minister to keep in contact with them and to hold a further meeting at the end of the year. The Prime Minister took note of this.

Your sincerely

Andrew Turnbull

ANDREW TURNBULL

Tom Jeffery, Esq.,
Department of Education and Science



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PRIME MINISTER

NATIONAL CURRICULUM: ENGLISH

1. Last October Peter Walker and I published our proposals for English attainment targets and programmes of study for pupils in primary schools. They were based on the work of the English Working Group chaired by Brian Cox but also proposed changes to strengthen the attainment targets. Our particular concern was to ensure that the teaching of grammar is fully and explicitly recognised.
2. We have now received the National Curriculum Council's statutory advice on attainment targets and programmes of study. It goes some way towards making the improvements we proposed, but does not go far enough.
3. The immediate priority is to establish statutory attainment targets and programmes of study for 5-7 year olds. We intend to implement the Order making those requirements in schools this Autumn, alongside those for mathematics and science. We have concentrated attention on getting these first requirements right. We shall work on improving the attainment targets for other pupils over the next few months, with advice from Brian Cox, so that they will be ready for implementation in Autumn 1990.
4. I attach revised versions of the attainment targets and programmes of study for 5-7 year olds, which we propose should go in the Order. They are much sharper and tighter than those recommended by the NCC, and should ensure a solid

grounding in English for all infant school pupils. Proper teaching of punctuation and spelling and knowledge of the simpler grammatical terms are explicitly required. We are confident that we can secure the support of both the NCC and Brian Cox's Working Group for the revised versions.

5. We must now publish a draft statutory Order for consultation before the final Order is made, together with a note, which is attached, of our reasons for departing from the NCC's advice. This further statutory consultation will give us time and opportunity to introduce into the Order more specific examples of what is wanted.

6. To give schools the time to prepare for implementing these requirements this autumn, they must have the final Order early in the summer term. We are required to consult on the draft for a minimum period of one month. We must therefore aim to publish the draft by no later than 17 March. We should be grateful for your early agreement that we should proceed.

KS.

KB

Department of Education and Science

10 March 1989

ATTAINMENT TARGET 1: SPEAKING AND LISTENING

Pupils should demonstrate their understanding of the spoken word and the capacity to express themselves effectively in a variety of speaking and listening activities, matching style and response to audience and purpose.

All ATs which require pupils to speak also require that their speech should be audible.

Pupils should be able to:

Level

- | | | | |
|---|-------|-----|--|
| | 1 | i | Participate as speakers and listeners in group activities, including imaginative play. |
| | | ii | Listen attentively, and respond, to stories and poems. |
| | | iii | Respond to <u>simple</u> instructions given by a teacher, eg to do two consecutive actions - go somewhere, do something. |
| Σ | <hr/> | | |
| | 2 | i | Participate as <u>speakers</u> and <u>listeners</u> in a group engaged in a prescribed task, eg designing or making something. |
| | | ii | Describe an event briefly to the teacher or another pupil. |
| | | iii | Listen attentively to stories and poems, and talk <u>about them</u> . |
| | | iv | Talk to the teacher, listen and ask and answer questions, eg programmes of study paragraph 4v. |
| | | v | Respond to a wider range of more complex instructions, eg collect books, paper and pencils from cupboard; give each child one book, two pencils and three pieces of paper; then give teacher what's left over. |
-

Level

- 3
||
- i Relate real or imaginary events in a connected narrative which conveys meaning to a group of pupils, the teacher or another known adult.
 - ii Convey accurately a simple message eg in role-play, or for a practical purpose such as relaying a telephone message.
 - iii Listen with an increased span of concentration to other children and adults, asking and responding to questions and commenting on what has been said, eg programmes of study paragraph 2i-iii.
 - iv Give, and receive and follow accurately, precise instructions when pursuing a task individually or as a member of a group, eg planning to make a model or arrange an outing.
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ATTAINMENT TARGET 2: READING

The development of the ability to read, understand and respond to all types of writing, as well as the development of information-retrieval strategies for the purposes of study.

Pupils should be able to:

Level

- 1
- i Recognise that print carries meaning, both in books and in the everyday world, eg PoS paras 7, 9ii.
 - ii Begin to recognise individual words or letters in familiar contexts, eg PoS para 9ii.
 - iii Show signs of a developing interest in reading, eg PoS para 9vi.
 - iv Begin talk about the content of stories, or information in non-fiction books, eg PoS para 9v, vii.

-
- 2
- i Read accurately straight-forward signs, labels and notices, eg PoS para 9ii.
 - ii Demonstrate knowledge of the alphabet in using word books, dictionaries and reference books.
 - iii Use, as appropriate, a combination of picture and context cues, words recognised on sight and phonic cues in reading, eg PoS para 10iii.
 - iv Describe what has happened in a story and predict what will happen next.
 - v Listen and respond to stories and poems, expressing opinions informed by what has been read, eg PoS para 9v, vii.
 - vi Read with increasing independence, confidence, fluency, accuracy and understanding a range of appropriate material, eg PoS para 7.
-

thereby demonstrating understanding

Level	Statements of attainment
3	i Read aloud from familiar stories and poems fluently with appropriate expression, eg PoS para 10v.
	ii Read silently and with sustained concentration.
	iii Continue to listen attentively to stories, showing an ability to recall significant details and to talk about setting, plot and characters.
	iv Demonstrate, in talking about stories and poems, that they are beginning to use inference, deduction and previous reading experience to find and appreciate meanings which are beyond the literal.
	Begin to v bring to their writing and discussion about stories an understanding of the way stories are structured.
	vi <u>Devise a clear set of reasoned questions in order to select and use appropriate information sources and reference books from the class and school library, eg PoS para 9ix.</u>

ATTAINMENT TARGET 3: WRITING

A growing ability to construct and convey meaning in written language matching style to audience and purpose.

Pupils should be able to:

Level

- | | | |
|-------|-----|--|
| 1 | i | Use pictures, symbols or isolated letters, words or phrases to communicate meaning. |
| <hr/> | | |
| 2 | i | Produce independently short pieces of writing using complete sentences, some demarcated with capital letters and full stops or question marks. |
| | ii | Write stories showing an understanding of the rudiments of story structure by establishing an opening, characters and one or more events. |
| | iii | Structure sequences of real or imagined events coherently in chronological accounts. |
| | iv | Produce simple non-chronological writing, eg PoS para 18ii. |
| <hr/> | | |
| 3 | i | Produce independently longer pieces of writing using complete sentences, mainly demarcated with capital letters and full stops or question marks. |
| | ii | Write more complex stories with detail beyond simple events and a defined ending. |
| | iii | Shape chronological writing beginning to use a wider range of sentence connectives than 'and' and 'then', eg but, when, after. |
| | iv | Produce a wider range of types of non-chronological writing eg PoS para 18ii. |
| | v | Begin to revise and redraft in discussion with the teacher, other adults, or other children in the class, eg PoS para 23 Final drafted versions of writing should be demonstrably more fluently written and grammatically punctuated. |
| <hr/> | | |
| | vi | Begin to use tenses consistently and correctly appropriately. |

ATTAINMENT TARGET 4: SPELLING

Pupils should be able to:

Level

- | | | |
|-------|-----|---|
| 1 | i | Begin to show an understanding of the difference between drawing and writing, and between numbers and letters. |
| | ii | Write some letter shapes in response to <u>speech</u> sounds and letter names. |
| | iii | Use <u>at least</u> single letters or <u>groups</u> of letters to represent whole words or parts of words. |
| <hr/> | | |
| 2 | i | Produce recognisable (though not necessarily always correct) spellings of a range of common words. |
| | ii | Spell correctly <u>monosyllabic</u> words in regular use in their own writing which observe common patterns. |
| | iii | Recognise that spelling has patterns, and begin to apply their knowledge of those patterns in their attempts to spell a wider range of words. |
| | iv | Show knowledge of the names and order of the letters of the alphabet. |
| <hr/> | | |
| 3 | i | Spell correctly <u>polysyllabic</u> words in regular use in their own writing which observe common patterns. |
| | ii | Recognise and use correctly regular patterns for vowel sounds and common letter strings of increasing complexity. |
| | iii | Show a growing awareness of word families and their relationships. |
| | iv | In revising and redrafting their writing, begin to check the accuracy of their spelling, eg by using a simple dictionary. |
| <hr/> | | |

ATTAINMENT TARGET 5: HANDWRITING

Pupils should be able to:

Level

- | | | |
|---|----|--|
| 1 | i | Begin to form letters with some control over the size, shape and/or orientation of letters or lines of writing. |
| 2 | i | Produce legible upper and lower case letters in one style (eg printed), and use them consistently (ie not randomly mixed within words). |
| | ii | Produce letters that are properly oriented (eg so that 'b' and 'd' are distinct) and that have clear ascenders and descenders where necessary (eg so that 'n' and 'h' are distinct). |
| 3 | i | Begin to produce a clear and legible cursive style. |

6. RECOMMENDATIONS FOR PROGRAMMES OF STUDY
FOR KEY STAGE 1

PROGRAMMES OF STUDY FOR SPEAKING AND LISTENING
(ATTAINMENT TARGET 1)

1. Through the programmes of study, children should encounter a range of situations and activities which are designed to develop their competence, precision and confidence in speaking and listening, irrespective of their initial competence or home language.
2. These planned situations and activities should cover:
 - i. working with other children and adults, eg involving others in a discussion; listening to, and giving weight to, the opinions of others; perceiving the relevance of contributions; timing contributions; adjusting and adapting to views expressed;
 - ii. development of listening (and, as appropriate, reactive) skills in non-reciprocal situations, eg radio programmes, tannoying of fire instructions;
 - iii. development of speaking and listening skills, both when role-playing and otherwise, for example when describing experiences, expressing opinions, articulating personal feelings and formulating and making appropriate responses to increasingly complex instructions and questions;
 - iv. development, by informal means and in the course of purposeful activities, of pupils' powers of attention, grasp of turn-taking, ability to gain and hold the attention of their listeners, and ability to disagree courteously with an opposing point of view.
3. All activities should:
 - i. help to develop in pupils' speaking and listening their grasp of sequence, cause and effect, reasoning, sense of consistency, appreciation of relevance and irrelevance, and powers of prediction and recall;
 - ii. by informal and indirect means develop pupils' ability to adjust the language they use and its delivery to suit particular audiences, purposes and contexts and, when listening to others, to respond to different ways of talking in different contexts and for different purposes. Pupils should therefore be encouraged to reflect on and evaluate their use of spoken language and to reformulate it to help the listener;
 - iii. draw on examples from across the curriculum, and in particular relate to existing requirements for mathematics and science which refer to use of spoken language and vocabulary, asking questions, working in groups, explaining and presenting ideas, giving and understanding instructions.

Programmes of study for levels 1-3 (5- to 7- year olds)

4. The range of activities designed to develop children's ability to speak and listen should include:

- ? I think this must be what Brian says.
- i. listening and responding to stories, rhymes, poems and songs. These should include examples from different cultures and authors, and children's own work;
 - ii. securing responses to visual and aural stimuli, eg pictures, television, radio, telephone, making use of audio and video recordings as appropriate;
 - iii. discussing their work [with other children] and the teacher;
 - iv. co-operative planning of activities in a way which requires pupils to speak and listen;
 - v. talking about things done in or out of school, such as a school trip, a family outing, a television programme seen;
 - vi. telling stories and performing poems which have been learnt by heart;
 - vii. collaborative and exploratory play;
 - viii. imaginative play and improvised drama;
 - ix. giving and receiving simple explanations, information and instructions; asking and answering questions.
5. All activities should:
- i. include provision for children to talk and listen in groups of different sizes and to a range of audiences;
 - ii. emphasise the importance of audibility.

PROGRAMMES OF STUDY FOR READING
(ATTAINMENT TARGET 2)

Programmes of study for key stage 1 (5- to 7-year-olds)

6. Reading activities should build on the children's oral language and experiences which they bring from home. Teaching should cover an appropriate range of good-quality texts, both fiction and non-fiction; and should ensure that pupils regularly hear stories, ~~told or read aloud, and hear and share poetry read~~ by the teacher.

of the English literary heritage.

7. Reading should include picture books, nursery rhymes, poems, folk tales, myths, legends and other literature which takes account of pupils' linguistic competences and backgrounds. Both boys and girls should experience the full range of children's literature. Non-fiction texts should include those closely related to the world of the child and extend to those which enable children to deepen an understanding of themselves and the world in which they live, eg books about weather, wild life, other countries, food, transport, the stars. Pupils should encounter an environment in which they are surrounded by books and other reading material presented in an attractive and inviting way. The reading material should include material which relates to the real world, such as labels, captions, notices, children's newspapers, books of instructions, plans, diagrams, computer print-out and visual display.

8. Pupils' own writing - either independently written, or stories dictated to the teacher, or composed in collaboration with other pupils - should form part of the resources for reading.

9. Teaching activities should ensure that pupils:

- i. hear books, stories and poems read aloud or on tape and take part in shared reading experiences with other pupils and the teacher, using texts composed and dictated by the pupils themselves, as well as rhymes, poems, songs and familiar stories (including traditional stories from a variety of cultures);
- ii. read in the context of role-play and dramatic play (eg in the home-play corner, class shop, or other dramatic play setting such as a café, hospital or post office). For example, reading would include a menu, a sign on a door, a label on a packet, or a sign above a counter. To start with, pupils will recognise individual letters, such as "P" for Parking, or individual words, such as "Exit";
- iii. re-tell, re-read or dramatise favourite stories;
- iv. make their own books about particular experiences, areas of interest or personal stories which exemplify for the reader the author's intention, eg guide books, instructions, favourite poems or stories;
- v. read and talk to the teacher ~~and each other~~ about the books they have been reading, listening to or writing, including those experienced through radio and television;

- vi. turn readily to books, choosing those which they would like to hear or read;
 - vii. ask and answer questions about what has been heard or read, for example to develop an understanding of how characters feel, as well as their motives, and a response to story endings;
 - viii. ~~talk~~ talk about the ways in which language is written down (eg in shared reading or writing sessions, or in discussion with the teacher), identify words, phrases, patterns of letters and other features of written language which they recognise, and notice how words are constructed and spelled;
 - ix. refer to information books, dictionaries and word books as a matter of course. Pupils should be encouraged to formulate first the questions they need to answer through recourse to such books, so that they use them effectively and do not simply copy material verbatim;
 - x. talk about the content of information texts.
10. The programme of study should enable pupils to:
- i. appreciate the significance of print and the fact that pictures and other visual media can also convey meaning, eg road signs, logos;
 - ii. develop an increasing vocabulary of words recognised on sight;
 - iii. use, as appropriate, all the available cues, such as pictures, context, phonic cues, word shapes and meaning of a passage to decipher new words;
 - iv. be ready to make informed guesses, and to correct themselves in the light of additional information (eg by reading ahead or looking back in the text);
 - v. develop the capacity to convey, when reading aloud, the meaning of the text clearly to the listener through intonation and phrasing.
- iv. develop the habit of silent reading.
11. Teachers should take account of the important link between home and school, actively encouraging parents to participate and share in their child's reading and supporting pupils where this is not possible.

Such knowledge about language can serve to help fluency in both languages and the aim of the English programme is universal competence in Standard English for all pupils.

PROGRAMMES OF STUDY FOR WRITING, SPELLING AND HANDWRITING
(ATTAINMENT TARGETS 3, 4 AND 5)

Programme of study for key stage 1 (5- to 7-year-olds)

12. Pupils should have varied and frequent opportunities to write. They will need a variety of papers and note pads, large pencils and pens which flow easily, and plenty of space to write comfortably. There should be a well-defined writing area in the classroom, laid out with a variety of materials, notice boards, post boxes and, wherever possible, both a suitably programmed computer for word-processing and a printer for 'publishing' the children's work.

13. Pupils should write ^{about} ~~or "play" write in~~ a wide range of activities, eg in a play house, class shop, office, hospital. ~~Early "play" writing should be encouraged and respected.~~

14. Pupils will have seen different kinds of writing in the home - their names on birthday cards or letters, forms, shopping lists and so on. Those whose parents are literate in a language other than English will have observed writing in their own first language, sometimes using a different writing system. ~~Such awareness of writing in any form can help pupils to understand some of the functions of written language and should be used to promote their understanding of the functions of the English writing system.~~

15. Pupils should see adults writing. Teachers should write alongside pupils, for example sharing and talking about notes and diagrams, so that the range of uses of writing is brought out. Pupils should be made aware of how pieces of work they have produced relate to adult uses of writing.

16. Pupils should be taught the conventional ways of forming letter shapes, first lower case and then capitals, through purposeful guided practice in order to foster a comfortable and legible handwriting style. Pupils should be enabled to compose at greater length than they can manage to write down by themselves, by, for example;

- i. dictating to their teacher or another adult, or into a tape recorder;
- ii. working with other children;
- iii. using a word processor. Pupils should be able to produce copies of work drafted on a computer, and encouraged to incorporate the print-out in other work, including displays.

17. As they become familiar with the conventions of writing, pupils should be introduced to the most common spelling patterns of consonant sounds and short vowel sounds. Pupils should be taught how to spell words which occur frequently, or which are important to them, in their writing, and those which exemplify regular spelling patterns. They should attempt the spelling of words for themselves, without undue dependence on an adult. They should be taught the names of the letters and the order of the alphabet.

18. Pupils should:
- i. undertake chronological writing which includes diaries, stories, letters, accounts of tasks they have done and of personal experiences, records of observations they have made, eg in science, and instructions such as recipes;
 - ii. undertake non-chronological writing which includes, for pupils at level 2, lists, captions, labels, invitations, greetings cards, notices, posters and, for pupils at level 3, plans and diagrams, descriptions, eg of a person or place, notes for an activity, eg in science or designing and making;
 - iii. play with language, making up jingles, poems, word games, riddles, and games which involve word and spelling patterns.
19. Pupils should share their writing with others, discuss what they have written, and publish stories, newspapers, magazines, games and guides for other children.
20. They should be asked to write in response to a wide range of stories and poems which they have heard or read and television programmes which they have seen.
21. Pupils should be taught to help the reader by leaving a space between words and by ending sentences with a full stop or question mark and by beginning them with a capital letter.
22. Pupils should discuss their writing frequently, talking about the varied types and purposes of writing, eg list, poem, story, recipe. ~~Teachers should talk about correct spelling and punctuation and should teach terms like punctuation, letter, capital letter, full stop, question mark.~~
23. Pupils at level 3 should be shown how to redraft their work when appropriate. They should be taught to look for instances where:
- i. ideas should be differently ordered or more fully expressed in order to convey their meaning;
 - ii. tenses or pronouns have been used inconsistently;
 - iii. meaning is unclear because of insufficient punctuation or omitted words;
 - iv. meaning would be improved by a richer or more precise choice of vocabulary.
24. They should be taught terms like sentence, verb, tense, noun, pronoun.

Pupils should be taught correct spelling and punctuation of the English language eg letter, capital letters, full stop, question mark.

STATEMENT OF REASONS FOR CHANGES

1. NCC's main recommendations, relating to the merging of attainment targets for reading, the treatment of drama, media studies and information technology, and special educational needs, have been accepted. However, a number of changes have been made to the texts of the statements of attainment and programmes of study as set out in the NCC's report and recommendations. These fall into 5 main categories:
- (a) restoration of material originally in the Secretary of State's proposals, much of it necessary to bring the substance of the attainment targets and of the programmes of study into line;
 - (b) revisions to bring out lines of development in learning, and to achieve consistency between levels of attainment;
 - (c) changes to introduce greater precision into the requirements;
 - (d) drafting changes which clarify meaning or put propositions in language appropriate for statutory requirements - for example by distinguishing what is required from exemplary material
 - (e) transfer of material included as examples of statements of attainment to the programmes of study, or introduction of cross-references between the two, in order to avoid repetition.
2. Overall, these changes do not materially alter the extent of what is required; nor the level of expectation of attainment and about what will be taught; nor the content of teaching and learning. They do however clarify intentions and remove inconsistencies. The main changes made are outlined below.

AT 1 - Speaking and Listening

Level 2 The NCC's second statement of attainment has been divided into two (nos (iv) and (v)) to bring out the separate strands of development - in general talk and response, and in coping with instructions. Statement No (v) has been more clearly stated.

Level 3 The need to convey meaning through narrative has been introduced in the first statement of attainment.

General Most exemplary material - which is in any case non-statutory - is now included in the programme of study.

AT2 - Reading

Level 1 The NCC's third statement of attainment - now the fourth - has been reworded to add precision and to recognise the stage of development appropriate to discussion by pupils at Level 1.

Level 2 The NCC's first statement of attainment - now the second - has been reworded to make clear the circumstances in which pupils should demonstrate knowledge of the alphabet. This brings out the stage of development expected.

The second NCC statement - now third - has been reworded to give an accurate description of cues which pupils should use in reading, and to make clear that they are not expected to use all of them all the time.

Level 3 The NCC's fifth statement of attainment - now the sixth - has been revised to make more precise what is required - that pupils should know how to set about using information sources.

The NCC's sixth statement - now the third - has been extended to make more precise what pupils should be expected to draw from listening to stories.

General Material has been transferred, where appropriate, from the examples to the programmes of study.

AT 3 - writing

Attention is drawn to the importance of recognising that performance in writing depends on the nature of the task and that development is not linear.

Level 3 NCC's first statement of attainment - now second - has been made more precise by redrafting and by adding exemplary material to the statement.

NCC second, fourth and fifth statements have been replaced by the second and third statements which are revised to bring out separate strands of development in writing - chronological writing eg narrative and non-chronological eg descriptive. Some material eg on use of tenses is specified in the programme of study.

AT 4 - Spelling

Level 2 NCC's third statement of attainment - now second - has been amended to bring out the development from spelling of monosyllabic to polysyllabic words.

A fourth statement has been added - knowledge of the alphabet.

Level 3 The first statement is amended to mark progression from spelling monosyllabic words to polysyllabic words, and to clarify the meaning.

AT 5 - Handwriting

Level 2 The two statements have been rewritten to clarify and make more precise what is expected - consistent use of legible upper and lower case letters; and properly constructed and oriented letters.

Programmes of study for Speaking and Listening

The NCC's general propositions applicable to the programmes of study for both Key Stage 1 and Key Stage 2 have been reformulated

- (a) to convey matters, skills and processes which are required to be taught;
- (b) to apply to Key Stage 1 only
- (c) to include material which is necessary to complement the attainment targets

Of the specific points in the programme of study for Key Stage 1:- (para 4)

- point (ii) is new, but takes in the NCC's proposal as an example
- in point (iii), the NCC's example is omitted as inappropriate to Key Stage 1
- point (iv) is redrafted to improve clarity and precision.
- point (vi) is amended to remove duplication of point (i) and to add performance of poetry learnt by heart
- points (vii) and (viii) replace the NCC's proposal on role play and imaginative play, to distinguish collaborative and exploratory play from imaginative play and improvised drama.

Programme of Study for Reading

The NCC's opening statement has been redrafted to reflect the fact that some children bring no experience of reading and story from home. The second paragraph has been redrafted to make it appropriate to requirements for a programme of study, to add examples of non-fiction which should be used, to make clear that both sexes should experience the full range of literature and to

emphasise the importance of exposing pupils to books and other reading matter at school.

Para 9(iv) now makes clear that making books is an important development strand in enhancing pupils' appreciation of the purposes of text.

Para 9(vii) has been added to reflect what is in the attainment targets.

Other changes have been made to improve drafting and precision and to make the statements appropriate as statutory requirements.

Programmes of Study for Writing, spelling and handwriting

Para 13 has been added to bring out the importance of play writing to earliest writing development; additions to para 3 reinforce that point.

Paragraph 15 re-presents NCC's paragraph 3, to make clear the strands of development - from early play writing and growing awareness of the functions of writing, to actual practice.

Paragraph 17 makes more precise what is expected in the teaching of spelling during Key Stage 1.

Paragraph 18 represents the NCC's material so that it matches with the strands of development implied by the statements of attainment on chronological and non-chronological writing.

Paragraph 21 amplifies the NCC material by making clear what must be taught in order to ensure that what is written helps the reader.

Paragraph 22 and 23 specify more clearly what kind of teaching about spelling and punctuation is required, and what is appropriate for pupils at different levels.

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✓ C/BG
B



FROM THE VICE-CHANCELLOR - THE UNIVERSITY - MANCHESTER - M13 9PL

Professor Sir Mark Richmond
Sc.D., F.R.S.
Vice-Chancellor

Telephone: 061-273 3333

March 10th.

Dear Mr. Turnbull,

Herewith the promised document for our meeting
with the Prime Minister on Monday March 13th. at 3.00 pm.

Yours sincerely,

Mark Richmond

Mr. A. Turnbull,
No. 10, Downing Street,
London, SW.

AGENDA FOR DISCUSSION

We would request Government to do the following to assist the further development and expansion of the UK university system:

- a) Acknowledge what has been achieved over the last decade and recognise the high esteem in which UK universities are held at home and internationally.
- b) Acknowledge that a strong university sector is vital to the future strength and well-being of our country. This is true not only for the purposes of 1992 but also to defeat international competition.
- c) Encourage the further diversification of our university system. Positively support (and certainly do not hinder) those who seek a diversity of funding from the private sector.
- d) Ensure that any changes in student support meet the criteria of adequacy, certainty, simplicity and social justice.
- e) Give those with a good track record of running their institutions the freedom to exercise their entrepreneurial and managerial skills. Above all let the arrival of the UFC mark an end to the debilitating bureaucracy of the last few years. That is not to argue that accountability for public money is not essential. It is, but it is fully compatible with autonomy.
- f) Give the universities adequate resource to carry forward the evolutionary changes they wish to bring about. In particular allow university staff a salary settlement no less generous than those in comparable sectors. Staff motivation is essential for rapid and effective change.
- g) Commit the Government to encouraging universities to respond to the needs of the employment market but leave it to individual institutions to evolve effective ways of doing this.
- h) Take appropriate steps to ensure that top quality fundamental research is not lost from the university system.
- i) Give the UFC the task of liberating our initiative not forcing us into a rigid mould.

BACKGROUND

1. Much has changed in the universities since 1981. They are more open to change; they are more effectively managed and they are producing students of enhanced quality.

Where next?

2. Graduate recruiters are predicting a 10% increase in vacancies for graduates this year. So far the necessary supply of potential students seems to be there. Applications for 1989 are up 9% to the universities and up 11% to the polytechnics compared with 1988 despite a falling age cohort. (The polytechnic figures include non-degree level work). But there are too few scientists and mathematicians coming forward to match the likely needs of industry and commerce for technologists.
3. To help meet demand universities must open up institutions to students from a wider range of backgrounds and attainments. This will present us with a formidable challenge if we are not to lower our standards and the quality of our output. We will need new teaching programmes, radical adjustments to degree courses and more direct and continuous teacher involvement with students. In short: the workload of the universities will increase further, even disproportionately to the extra numbers.
4. Unless the universities cut back sharply on research this will require more resources.
5. Universities have made or are planning to make changes to meet demand. But to ensure effectiveness major decisions are now needed about issues of supply, demand and resource: decisions which could radically reshape our universities.
- 6.1 First, which voice in the market should have priority?
There are four major contenders:
 - a) potential students
 - b) employers
 - c) a central planning body
 - d) the research community

2.

- 6.2 As far as students [6.1(a)] are concerned, the mismatch mentioned in paragraph 2 could be influenced by coupling student finance more tightly to the needs of the market place.
- 6.3 Where employers are concerned there is widespread agreement that the needs of the employment market should be reflected but less on how this should be done. Opinions are sharply divided (both within Government and without) as to the relative importance of market forces [6.1(b)] and manpower planning [6.1(c)].
- 7.1 Inextricably entangled with the question of whose needs are to take precedence, is the question of who should pay. Is the whole system to be funded by the taxpayer? Or is some/most of the necessary finance to come from the private sector? And if it is to be the latter does that mean families or employers or both?
- 7.2 If private sector finance is to come from employers, they would be more likely to favour paying for relatively short term and perhaps local solutions to their particular recruitment problems than for national manpower plans.
- 7.3 If it is to be student financed, a number of possible schemes have been suggested ranging from full-cost fees to partial systems of top-up fees for some students, or some courses, or some institutions. All would to a greater or lesser extent, link the resourcing to the students and would depend on their willingness to mortgage their futures by borrowing the cost of a particular route to a degree. All schemes so far put forward build in a scholarship element for the underprivileged. This needs to be generous enough to ensure that the new arrangements do not stem the flow of future graduates.
8. Once the decisions in principle are taken we would urge you to instruct the UFC to steer the university system with a light hand and not to seem to interfere with the developments in universities paid for other than by the Council. This must be the best way to release the universities' entrepreneurial initiative, to shape the system for the future.

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B



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- d) Ensure that any changes in student support meet the criteria of adequacy, certainty, simplicity and social justice.
- e) Give those with a good track record of running their institutions the freedom to exercise their entrepreneurial and managerial skills. Above all let the arrival of the UFC mark an end to the debilitating bureaucracy of the last few years. That is not to argue that accountability for public money is not essential. It is, but it is fully compatible with autonomy.
- f) Give the universities adequate resource to carry forward the evolutionary changes they wish to bring about. In particular allow university staff a salary settlement no less generous than those in comparable sectors. Staff motivation is essential for rapid and effective change.
- g) Commit the Government to encouraging universities to respond to the needs of the employment market but leave it to individual institutions to evolve effective ways of doing this.
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2.

- 6.2 As far as students [6.1(a)] are concerned, the mismatch mentioned in paragraph 2 could be influenced by coupling student finance more tightly to the needs of the market place.
- 6.3 Where employers are concerned there is widespread agreement that the needs of the employment market should be reflected but less on how this should be done. Opinions are sharply divided (both within Government and without) as to the relative importance of market forces [6.1(b)] and manpower planning [6.1(c)].
- 7.1 Inextricably entangled with the question of whose needs are to take precedence, is the question of who should pay. Is the whole system to be funded by the taxpayer? Or is some/most of the necessary finance to come from the private sector? And if it is to be the latter does that mean families or employers or both?
- 7.2 If private sector finance is to come from employers, they would be more likely to favour paying for relatively short term and perhaps local solutions to their particular recruitment problems than for national manpower plans.
- 7.3 If it is to be student financed, a number of possible schemes have been suggested ranging from full-cost fees to partial systems of top-up fees for some students, or some courses, or some institutions. All would to a greater or lesser extent, link the resourcing to the students and would depend on their willingness to mortgage their futures by borrowing the cost of a particular route to a degree. All schemes so far put forward build in a scholarship element for the underprivileged. This needs to be generous enough to ensure that the new arrangements do not stem the flow of future graduates.
8. Once the decisions in principle are taken we would urge you to instruct the UFG to steer the university system with a light hand and not to seem to interfere with the developments in universities paid for other than by the Council. This must be the best way to release the universities' entrepreneurial initiative, to shape the system for the future.

cc Baker.

MEETING WITH UNIVERSITY VICE-CHANCELLORS

Although the origins of this meeting were defensive, to head off Lord Callaghan's approach, it provides an opportunity to get the Government's case across to the universities as well as to hear their concerns.

The papers are:

Flag A - a DES brief;

Flag B - the paper by the Vice-Chancellors;

Flag C - a Policy Unit note which comments on the above.

What is remarkable is that the Vice-Chancellors' paper appears to espouse many of the Government's policies but you will want to probe whether there is really unity even within the group you are meeting, let alone among universities generally.

Also attached are two papers by Robert Jackson which have reached us privately. The first - Flag D - sets out his view of where universities should be going; the second - Flag E - is an article identifying the factors which have made American universities successful.

The press are aware that this meeting is taking place. They have been told that it is an occasion for a general exchange of views. You will need to agree with them the line to be taken after the meeting. DES and the Treasury have agreed a revised pay offer to university teachers and the money to fund it. The University teachers have been told that an improved offer will be made formally at a meeting on Wednesday. In view of this there is no reason whatsoever to discuss the current pay dispute at this meeting.

Mr. Baker will be arriving 15 minutes before the meeting to discuss its handling.

Patricia A. Parkin
ANDREW TURNBULL *Patricia A. Parkin*
10 March 1989

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS, 13 MARCH

OBJECTIVES

1. To hear what the Vice-chancellors have to say.
2. To set out the Government's ideas for change in the Higher Education system.
3. To explain what this means for the relationship between the Government and the Universities.

PRESS BRIEFING

Vice-Chancellors talk to the press and usually get reported. The Press will want to know:

- what happened on pay? (see separate brief)
- is the Government quarrelling with the universities?
- how radical is the Government's agenda?

The Prime Minister may want to agree with the Vice-Chancellors what should be said to the press after the meeting.

INTRODUCTION

"I am glad of this informal chance to hear at first hand your views on the position of universities. I should first say:-

- a. The Government doesn't want to run the Universities. That's why we have set up the Universities Funding Council at arm's length. Your independence is enshrined in your Charters and now by statute. But, of course, Parliament expects accountability for the annual £1.7 billion grant.
- b. Since 1979, there has been a tremendous growth in student numbers - to nearly a million today. Most of this has been in the polytechnics.
- c. Ken Baker has made it clear that we now want to see a substantial increase in the proportion of 18-19 year olds entering Higher Education. We need more

highly qualified manpower. Building on our policies for the schools, it is your job - as well as the Polytechnics - to meet that need.

Against that background, Sir Mark, please set out what Vice-chancellors see as the main issues."

VICE-CHANCELLORS' LIKELY RESPONSE

The Vice-chancellors seem likely to say:-

- a. The universities are under-funded.
- b. They need a clear statement of the Government's view of the roles for central planning and market forces.
- c. They are concerned about academic pay.

YOUR RESPONSE

Funding

"We put over £3½ billion a year into Higher Education. This is more than most countries as a share of GDP. We get out of it a smaller participation rate than most.

"Since 1979-80 total UGC grant and fees has gone up by 5.9% in real [GDP deflator] terms."

"We announced £250m for restructuring in 1987. Last autumn we announced another £30m. [We're looking at the cost of the pay settlement.] You've got other sources of income."

Government's ideas for change

"Our central strategy is to control the cost of the public sector. This means that what we already put into higher

education has got to be used more effectively and other sources of funding have to be found."

"That is why our agenda for Higher Education runs like this:

- (i) Student Loans. We can't increase numbers substantially if we have to go on paying only grant for student maintenance. We are clear that top-up loans should be available alongside the grants.
- (ii) Diversify funding sources. Industrial support; alumni contributions; overseas fees; perhaps private fees for heavily oversubscribed courses.
- (iii) Put more finance behind student demand. We are aiming to more than double tuition fees (met by mandatory awards) and to reduce block grant correspondingly, so you have a bigger incentive to take on students. And we're looking at vouchers.
- (iv) Separate the funding of teaching and research, so we can all see what happens to the money intended for research.
- (v) Move away from national pay agreements towards greater responsiveness to local conditions and to more differentials.
- (vi) Improve quality by improving age structure and opportunities for 'new blood'."

Pay

[See separate brief.]

FURTHER RESPONSE (IF NEEDED)

"We provide about two thirds of your funding. That surely entitles us to ask whether it is being used effectively."

"It also entitles us to ask for some discretion in your public comments about central features of Government policy. It has not been helpful to have CVCP statements describing our proposals on student loans as inadequate. You can't have it all ways - telling the Government not to save on student living costs and asking for more for yourselves for pay.

"By all means debate our policies with us, but let's try to pull together in public. Not all Vice-Chancellors agree with what the CVCP says. You're onto a loser with the graduate tax: that's not how we want to pay for Higher Education."

Revise of 13 March

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS, 13 MARCH
UNIVERSITY PAY

OBJECTIVES

1. To keep up the momentum towards a settlement of the present dispute which accords with Government interests, and to impress on the Vice-Chancellors the Government's longer-term objectives for university pay.

BACKGROUND

2. The Vice-Chancellors offered their academic staff 3% on the grounds that they could afford no more. The Association of University Teachers (AUT) rejected this and its members subsequently voted to refuse appraisal and to boycott examinations pending a better offer. The Vice-Chancellors sought an extra £57m in 1989-90 and £80m in 1990-91 to enable them to make higher offers to academic staff and others, including technicians, whose grading structure they wish to change.

3. On Friday the DES offered them, with the consent of the Treasury, additional funding for pay, of £37m, £40m and £43m over the next three years. These sums are offered on the conditions that

- (i) at least 1% on the academic pay bill will be used to widen differentiation, eg better pay for the best professors, discretionary increments for good lecturers blocked on the scale maximum;
- (ii) at least £5m (3.5% on their pay bill) will be used to buy better working practices from the technicians;
- (iii) the delivery of these selective elements will be monitored.

These elements would be in addition to general increases of about 6% for all university staff.

4. The CVCP and AUT pay negotiators are meeting at 4.45 today. If the AUT can agree to cease action, the CVCP is likely to make an improved offer either today, or at a more formal meeting on Wednesday.

PRESS BRIEFING

5. The Department refrained from publicising the extra money on Friday to give the CVCP time to reach a settlement with the AUT. We expected the CVCP to do the same. They however put out a Press Notice indicating pleasure that the Government had acknowledged their case, but regret that there was not more new money: they emphasised that the offer of extra money was contingent on a cessation of action.

6. If the Press put questions on university pay following today's meeting, it will be best to say that it was not on the agenda. If journalists nonetheless persist, say that the Government has told the CVCP that it is willing to make limited additional funds available, but only if the action is called off first. It is now for the Vice-Chancellors to negotiate with the AUT.

LINE TO TAKE

1. Recent industrial action has damaged universities' standing. Must be called off before Government can release more funds.

2. We ask you to settle quickly with lecturers and technicians on terms consistent with the Government's offer, including more flexibility. The UPC will be asked to monitor delivery of the conditions placed on that offer.

3. For the longer term we want more differentiation in university pay to reward merit and market value; and more decided by the institution, less at the centre.

[If raised]

4. The Government will not offer any more money than it has already put on the table.

Revise of 13 March

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[If raised]

4. The Government will not offer any more money than it has already put on the table.



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ELIZABETH HOUSE
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Paul Gray
10 Downing Street
London SW1

10 March 1989

Dear Paul

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS 13 MARCH 1989

I attach for you briefing for the Prime Minister for her meeting on Monday with Vice-Chancellors of selected Universities.

Yours

Peter

P V D SWIFT
Private Secretary

INDEX TO BRIEFING NOTES

1. ACCESS TO HIGHER EDUCATION
2. UNIVERSITY FUNDING
3. UNIVERSITIES' FINANCIAL POSITION
4. THE TRANSITION FROM THE UGC TO THE UFC
5. THE PROPOSED SHIFT FROM RECURRENT GRANT TO TUITION FEES
6. THE SCOPE FOR TOP-UP "PRIVATE FEES"
7. VOUCHERS & MARKET FORCES IN STUDENT RECRUITMENT
8. SEPARATION OF FUNDING FOR TEACHING AND RESEARCH
9. MEDICAL EDUCATION
10. BRAIN DRAIN
11. SUBJECT REVIEWS
12. TOP-UP LOANS FOR STUDENTS

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS

1. ACCESS TO HIGHER EDUCATION

The Secretary of State has emphasised the importance of increasing the proportion of 18-19 year olds entering higher education from school or college, and increasing participation among non-traditional groups. Even so, dramatic demography is likely to lead to fewer HE students over the first half of the 1990s. When demography turns round, increased participation rates should translate into increased numbers, requiring a more varied higher education offering. The university sector in general has lagged behind the polytechnics and colleges: protecting the unit of resource at the expense of expanding numbers and gearing provision largely towards the traditional school leaver with A levels.

Ask the Vice-chancellors for their views on access. How are they planning to meet the demographic downturn in the 1990s? Will universities continue to cream off bright 18-19 year olds, or will they play their part by diversifying provision to meet wider HE needs? Generally, what do they see happening to their overall student numbers over the next 5 years to the low point in the school leaving age group?

2. UNIVERSITY FUNDING

Government grant to the university system in 1989-90 is about 5% up on 1988-89. This comes on top of increases of 10% for 1987-88 and 8% for 1988-89 which have helped pay for the UGC's £280m restructuring settlement in 1987. Earmarking of funds and high inflation of university costs have meant that increases in universities' basic grant have not kept up with their costs over the years, hence the need for the restructuring programme.

The public funding of universities and higher education generally is reviewed each year in the PES process. Government has provided generous settlements for the university system in recent years. Indeed, the aggregate of total UGC grant and home tuition fees is 5.9% greater in real terms (GDP deflator) now than in 1979-80.

3. UNIVERSITIES' FINANCIAL POSITION

The university system currently has recurrent income of about £2.5bn and is running at an estimated deficit of £30m in 1988-89. The UGC monitors universities' financial health and, through its £280m restructuring programme, is helping them achieve institutional plans aimed at financial balance in good academic shape by 1990-91. The largest element of the restructuring programme is provision for the reimbursement of premature retirement compensation costs for some 2500 academic staff and 2000 non-academic staff by 1990-91.

The restructuring programme has been put in place to help universities live within their means. Universities are, of course, free to develop other sources of funding. The Government has made it clear that they will not be penalised for doing so.

4. THE TRANSITION FROM THE UGC TO THE UFC

The Universities Funding Council established under the Education Reform Act 1988 was incorporated in November and takes up its full responsibilities for funding universities on 1 April. The universities mounted a vociferous campaign against the relevant provisions, which they falsely accused of increasing the hand of Government in their affairs. In fact, the more business-oriented UFC is constitutionally more independent than the UGC, and can be expected to be in practice as well, while still heeding the Secretary of State's strategic guidance. The universities' current attitude is one of "wait and see".

The UFC is now established. Important that universities work with it. Notwithstanding all the fuss during the passage of the Education Reform Act, the new arrangements leave the Government with less power than was available under the non-statutory UGC arrangements: we are left with a proper balance between institutional autonomy and the need for accountability.

5. THE PROPOSED SHIFT FROM RECURRENT GRANT TO TUITION FEES

Government funding of general university provision is in the form of grants to the UFC for distribution to institutions, and to local authorities to meet student fees. Institutional funding accounts for over 90% of the total. The present fee of £607 represents only about 10% of the costs of an average student. Shifting the balance of public funding by increasing the fee element would increase the purchasing power of the students and should cause institutions to sharpen marketing and the effectiveness of their product in order to attract students and the higher income associated directly with them. The Secretary of State has said that he is considering this. DES officials are working up proposals.

What are the Vice-Chancellors' views on increasing the fee element of public funding of higher education? Do they have a view on the level at which the fee be pitched by reference to the present £607?

6. THE SCOPE FOR TOP-UP "PRIVATE FEES"

At present, the Secretary of State announces each year the level of tuition fee for mandatory award holders to be met from public funds. Part of the funding debate is whether higher education institutions should charge additional "top-up" fees, to be paid by students themselves. There is nothing to prevent this but, one or two courses excepted, it does not happen. The universities collectively will cite social justice: that higher education is a public good and that no individual should be denied its benefits through inability to pay.

[Let the Vice-Chancellors raise this. If they do..]

Point out that there is no obstacle in the way of their charging top-up fees, but ask what arrangements they would want to see to ensure that inability to pay such private fees was not a barrier.

7. VOUCHERS & MARKET FORCES IN STUDENT RECRUITMENT

Another part of the current funding debate concerns the channelling of public funds to institutions. Should this be via the students in the form of a voucher rather than through the Funding Councils and fees? There are mixed views among Vice-Chancellors, although the majority support the status quo. DES officials are examining what a possible voucher scheme might look like.

Ask the Vice-Chancellors what they think about vouchers. If they stop short of these, to what extent should the market force of student recruitment help shape provision? What other market forces should be brought into play - and how?

8. SEPARATION OF FUNDING FOR TEACHING AND RESEARCH

The Government has said it will move towards a clearer separation of funding for teaching and research in universities with the objective of encouraging universities to pay greater attention to how much they spend on research, and how it is distributed between faculties and departments. The details have yet to be finalised.

Universities spend a great deal - some £750m annually - on research. The Government intends that universities should ensure that this is spent to best effect - separation of funding for teaching and research will be a first step towards that goal.

9. MEDICAL EDUCATION

The undergraduate medical course is taught jointly by university clinical academics and NHS consultants and other staff. It involves both medical schools and teaching hospitals, and funding via the NHS and the UGC/UFC. There has been criticism of the planning and funding of medical education: in response a joint DES-DH steering group chaired by Sir Christopher France was established with representatives of parties interested in medical education to recommend improvements in organisation. Its work will now include assessing the impact of "Working for Patients" on medical education.

Accept that "Working for Patients" will have a significant impact on medical and dental education. The France group (on which CVCP is represented) has been charged with assessing the implications and recommending the way forward, whilst maintaining the high quality of both teaching and research.

10. BRAIN DRAIN

Anecdotal evidence for the "brain drain" is abundant - but is countered by the statistical evidence. Indeed, since 1980, the Universities Statistical Record indicates a net inflow of 360 people to jobs in British universities. Some worries remain about senior academic leaders and young post doctoral workers leaving the country. The introduction of more flexibility into academic pay, and a further round of new appointments for youngsters will help.

The figures on the number of academics leaving Britain put the anecdotal evidence into perspective. Universities can now use differentiated pay to attract and retain talented staff.

11. SUBJECT REVIEWS

The University Grants Committee has now undertaken some 25 subject reviews whose common purpose is to strengthen national provision in universities. The Government has welcomed the initiative, especially in expensive subjects - like sciences - where selectivity and concentration are worthwhile prizes. But implementation is sometimes controversial: veterinary education is the latest example; physics, chemistry and biology can be expected to follow suit. In any case, the point has been reached where decisions need to reflect the cumulative effect of successive reviews.

Affirm the need for concentration of provision if world-class teaching and research are to be achieved when research costs and scientific opportunities are increasing. Institutions should build on what they do best. Some proposals are, of course, controversial: that is not an argument for avoiding the rationalisation process, but does call for decisions to be soundly based after all interested parties have had a chance of airing their views.

It is interesting that voices are now heard calling for the Government to intervene in the veterinary review. In line with universities' and others' wishes, Government made this intentionally difficult in the Education Reform Act.

12. TOP-UP LOANS FOR STUDENTS

Background

Role of the universities

1. The universities' involvement in administration of the scheme is likely to be confined to certification of students' eligibility for a loan and disbursement of Access Funds.
2. Certification will involve documenting a student's entitlement to a loan, for the benefit of financial institutions disbursing the money. The DES has proposed that this should be carried out by the academic establishments, as they alone have the necessary contact with all students. In discussions, the establishments have raised concerns about having all the information (especially students' addresses) and administrative costs. But they do not rule out the proposed arrangements, and are considering them further.
3. Access Funds will provide support on a discretionary basis to students in special financial need. For the universities, the money will be distributed by the Universities Funding Council; the mechanism has yet to be settled. The establishments will administer the Funds, assessing individual circumstances and making payments.
4. Grants to students are at present made by local education authorities; the universities are not involved. The White Paper proposals will not change this, but the DES is nevertheless studying the implications of a transfer of responsibility for all student support to higher education institutions. There has been some discussion within the universities of the idea that they should become responsible for all student support, and not just the Access Funds. But the CVCP have recently proclaimed that the system would have to be restructured on lines proposed by them - see paragraph 6 below - if they were to be prepared to take it over.

CVCP response to the White Paper

5. The CVCP recognises that the beneficiaries of higher education should make some contribution to it. But it rejects the Government's plans, arguing that they do not meet its criteria of adequacy, certainty, simplicity and social justice:
 - the total support may be adequate for the average student but will not meet the needs of others, particularly those living in high-cost areas;
 - the plans leave the way open for the grant to be phased out altogether;

- retention of a parental contribution perpetuates an element of dependency and the risk that students might not secure the total resources they need;
- the HE Access Fund is inadequate; funds should be made available when young people are deciding whether or not to enter HE, not once they have already done so;
- there is no provision in any circumstances for students to obtain the necessary resources through grant alone;
- students will want to limit their debts and so will be deterred from long courses, from becoming postgraduates and from taking low-paid occupations; this could cause shortfalls in recruitment in certain areas.

6. Instead the CVCP propose an income-contingent graduate tax, payable only on higher-than-average earnings and over a finite period. The tax would relate to the monetary benefits accruing to a degree, not to the support received from the taxpayer in obtaining it. The real value of the grant would be restored with parental contribution and means test abolished.

Lines to take

a. CVCP response

7. We share the view that the beneficiaries of higher education should make some contribution towards its costs. The Government is still considering the repayment mechanism. But I must say that I am not attracted to the idea of a higher grant to be clawed back later in some cases through tax. Our aim is to increase students' self-reliance by giving them the opportunity to invest personally in their own future.

b. Access Funds

8. The DES will be discussing the operation of the Funds with the Funding Councils and representatives of the establishments.

c. Implementation of the scheme

9. Good progress is being made (despite press reports to the contrary) in our discussions with financial institutions about the administration of the scheme. Constructive discussions have been held with a number of individual financial institutions about their possible participation; and with the banking and building society sectors collectively, over the administrative structure of the scheme. Subject to Parliament's approving a Bill, we expect to implement the scheme in autumn 1990.

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS: FACTSHEET

UNIVERSITIES 1986-87 (GREAT BRITAIN)

Total no. of students - 340,720, of which: Arts = 48%, Science = 52%
Proportion of overseas students = 12%
Total recurrent income = £2484 million
Public funding via grant and fees = 62%

POLYTECHNICS 1986-87 (ENGLAND)

Total no. of students - 232,834, of which: Arts = 55%, Science = 45%
Proportion of overseas students = 3%
Total expenditure = £701 million
Proportion resourced by public funding via grant and fees = 93%

Bristol University

Vice-Chancellor: Sir John Kingman, mathematician, in post 4 years.
7591 students, of which Arts = 45%, Science = 55%. Proportion of overseas students = 6%. Total recurrent income = £57.3 million. Public funding via grant and fees = 66%.

Liverpool University

Vice-Chancellor: Professor Graeme Davies, metallurgist, in post 3 years. 8502 students, of which Arts = 37%, Science = 63%. Proportion of overseas students = 7%. Total recurrent income = £66.9 million. Public funding via grant and fees = 70%.

London University

Vice-Chancellor: Lord Flowers, physicist, in post 4 years. 48451 students, of which Arts = 35%, Science = 65%. Proportion of overseas students = 18%. Total recurrent income = £521.6 million. Public funding via grant and fees = 55%.

Manchester University

Vice-Chancellor: Sir Mark Richmond, microbiologist, in post 8 years (currently CVCP chairman). 12776 students, of which Arts = 46%, Science = 53%. Proportion of overseas students = 9%. Total recurrent income = £92.4 million. Public funding via grant and fees = 66%.

Oxford University

Vice-Chancellor: Sir Patrick Neill, jurist, in post 4 years. 14025 students, of which Arts = 59%, Science = 41%. Proportion of overseas students = 12%. Total recurrent income = £104.2 million. Public funding via grant and fees = 53%.

Reading University

Vice-Chancellor: Dr Ewan Page, statistician, in post 10 years. 6312 students, of which Arts = 53%, Science = 47%. Proportion of overseas students = 16%. Total recurrent income = £38.4 million. Public funding via grant and fees = 63%.

THE UNIVERSITIES

You have achieved a great deal in recent years in education: a major reform of schools and their curricula; polytechnics have been granted independence from local authorities; training for 16-19 year olds is being tackled by Normal Fowler.

Two remaining areas, however, still need thinking through at a fundamental level - the universities and teacher training. This meeting gives you the opportunity to begin tackling the future of the Universities.

Progress Since 1979 in Universities

Traditionally, British Universities have been autonomous institutions, funded mainly by government. They have enjoyed a large measure of freedom over their use of funds (bloc grant rather than fees) and have agreed with each other not to compete for students through fees. Meanwhile staff have enjoyed security of tenure and the subjects taught and researched have been partly a response to student need and partly the preferences of staff.

Since 1979 this cosy atmosphere has changed. By cutting the Universities' budget in the early 1980s, government has forced the Universities to:

- be more responsive to market needs (there are now over 23,000 courses);
- shed labour and be more efficient in teaching and administration;

- develop greater enterprise (there are about 500 university companies at present);
- sell places to overseas students (a current record high of 37,952) despite charging full fees;
- a closing of some departments, merging of others and the introduction of much better management systems.

All of this has been achieved with 10% fewer UGC-funded staff compared with 1981.

The result has been that the University world is now divided in two groups:

- (a) those who see private funding, university science parks, and greater involvement with business as new opportunities to be grasped - and who are spurred on to demand more freedom from government; and
- (b) those who feel spurned by government, forever complain about morale being at its lowest ever, point to the brain drain as the dissolution of once great institutions (especially Oxbridge), and claim that their underfunding by government is a cruel act of a philistine administration.

The paper before you has been put together by Sir Mark Richmond who is in the first category (just) and would be supported by Page (Reading) and Kingman (Bristol). The opposite view, which represents the dependency culture of the intellectuals is well represented by Neil (Oxford) and Flowers (London).

- Flag B

Their Agenda for Discussion

It requests government to do nine different things. Four of these (c, e, g, i) are requests for greater freedom! Two are simply that you acknowledge the importance of Universities. The remaining three are concerned with funding (a, f, h): top quality basic research, funding to achieve change and (although not altogether clear) adequate access funding when student loans are introduced.

Response

I believe that the proper response to support and encourage those who wish to see greater freedom and private funding, while recognising that there may need to be some pump-priming to buy structure change.

Recognise Contribution of Universities (a, b)

This can be readily acknowledged and should be a common ground from which to start:

- crucial to building first-class labour force, enterprise economy and technological innovation for 21st century;
- Universities have moved in the right direction during the 1980s.

Greater Freedom for Universities (c, g, e, i)

This is an issue which is likely to divide those present. It is worth probing the group in some detail as to what the points they make really mean, eg:

- (c) in which ways can government positively support those who seek private sector funding?

(e) & (i) the arrival of the UFC is seen as a liberation from the rigid bureaucracy of the UGC: how would they like the UFC to allocate funding and deal with them? (I believe they have many legitimate criticisms in this area which we need to listen to);

(g) giving individual institutions greater freedom is highly desirable but what precisely the VCs have in mind is not altogether clear. Can they tell us?

Resources (d, f, h)

Once again they have tried to paper over the cracks.

(d) ask them to spell out what this means? The introduction of access funding is crucial to the introduction of a system of loans - but I fear their criteria will be far more onerous and unacceptable;

(f) what kind of extra funding do the Universities need to carry forward "the evolutionary changes?"
My fear is that extra government funding is a barrier to change - unless the details of such change are worked out clearly in advance and agreed on paper.

What changes do they have in mind? Would they be prepared for some Universities to opt for extra funding on condition of change or should it be a requirement for all?

Kenneth Baker's Approach

Kenneth Baker has an agenda similar to the VC's who wish reform. He is interested in:

- (a) separating the cost of teaching from the cost of research, as a necessary step to
 - (b) reducing block grant funding to Universities and increasing the government funding of fees - so giving greater weight to students in driving the system;
 - (c) introducing a system of student loans
- but not
- (d) before the election at least, allowing private charging of students.

On this last delicate question, his approach is to encourage the Vice-Chancellors themselves to lobby government and then provide special access funding to them, if they would be prepared to move in this direction.

Introducing the first three of these changes will help change the system but the full benefits of greater freedom really flow from the last. Would some Universities be prepared to opt-out and do this? Oxbridge would probably not because of their egalitarian concept of a University, ~~and~~ and for the new Universities it may be risky other than in certain subjects which are in great demand. The most likely institutions to opt for charging would be ones such as Bristol, Durham, Manchester and Exeter etc.

A Way Forward

- 1 Welcome the enterprise within Universities in the 1980s and congratulate them on achievement.
- 2 Support those who would like greater freedom, and are prepared for a more student driven system, which is quite compatible with excellence.
- 3 Express the hope that the UFC will be far less bureaucratic than the UGC has been in the past.
- 4 Encourage those who wish greater freedom:

to get other Universities on side.
- 5 Discover under what conditions they would be prepared to break out from the present system and on what timescale it might be achieved.
- 6 The free market has limits applied to Universities, eg basic scientific research and certain humanities, will need permanent protection.

Brian Griffiths

BRIAN GRIFFITHS

SECRETARY OF STATE

cc Sir D Hancock
Mr Vereker
Mr Chamier
Mr Morgan

GOVERNMENT AND THE UNIVERSITIES: MEETING WITH THE PRIME MINISTER

I: The Historical Background: The Nationalisation of the Universities

1. Starting with the establishment of the UGC in 1919, the funding of the British universities became a national responsibility. From the beginning there was a tension between the nationalisation of university funding and the historic traditions of university autonomy. This tension was resolved by our predecessors, largely on the universities' terms, by conceiving Government funding as a form of deficit finance: its purpose was to make up the difference between the income of the universities from other sources, and their requirements for expenditure.

2. The consequences of this system could have been predicted: (a) income from non-Governmental sources has been minimised; (b) expenditure requirements have expanded without much sense of limits; and (c) the sense of the universities' proper responsibility for their own destinies has diminished.

3. When it was appreciated by the end of the 1970s that public expenditure needed to be better controlled, and that its share of GNP had to be reduced, it at last became necessary for Government and the universities to address these problems. But the assumptions, and to a lesser extent the structures, of the nationalised system based on deficit funding still remain in place. What is needed, and it is to be hoped that this meeting with the Prime Minister will help towards this, is a new conception of the relationship between Government and the universities.

II: The Government as Customer and Enabler

4. The key to this new conception is for the Government to see itself, and for the universities to see the Government, not as standing behind the universities in their provision of higher education, but as a customer, among other customers, for the services which universities provide, and as an enabler of others to purchase those services.

5. Let us look at this conceptual shift as it relates to the three issues identified above: (a) income, (b) expenditure, (c) responsibility.

III: Income: The University as an Independent Contractor

6. From the point of view of income, our problem is to break the deeply-rooted and widely-held assumption that it is the responsibility of Government to make up the difference between income and expenditure: so that there is no incentive to increase non-Governmental income because - so it is believed - such income will simply replace Government deficit funding. To break this belief the Government must identify much more clearly than was necessary under the deficit funding regime what goods it is "buying" from the universities. As these transactions become more transparent, it will be easier to demonstrate that income from the sale of services to Government is similar in principle to - although larger than - income from the sale or provision of services by universities to other customers.

7. A necessary step towards this transparency must be the disaggregation of the "block grant" - the central instrument of the deficit funding system - into, at least, its research and teaching components. On the research side, the grant-in-aid principle is inescapable, at least in respect of basic research; but the criteria for allocation can be made more transparent and appropriate. With regard to teaching we should aim to make a clear breach with the deficit funding system. A key step has already been taken in the promulgation, under the UGC's new funding methodology, of a fixed price - the "unit of resource" - which will be paid for each student in each subject-area. There is scope for argument about the principles by which this "price" is determined (it is not set competitively: it is fixed by fiat): but the fundamental point is now clear - or ought to be - that in respect of the teaching services provided by universities the Government is no longer funding deficits, but is, rather, buying student places.

8. The deficit funding principle survives, however, in the arrangement by which universities continue to be funded by block grants, albeit calculated on this price-per-student formula. The next step must be to shift money from the teaching block grant to an explicit capitation payment per student (the publicly funded fee). This is currently under discussion with the Treasury. Carried through to its logical conclusion we would entirely replace the block allocation for teaching with capitation payments: a voucher system. The great attraction of the voucher concept is that it is the most dramatic way of demonstrating that the Government is abandoning the principle of institutional deficit funding and embracing the new principle of the enablement of customers.

9. As we have seen, one of the pathologies of the nationalised system is the disincentives it creates for the generation of non-Governmental income. By restricting the growth of expenditure since 1979 we have forced the universities to increase their income from the sale of

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research services, and to begin to seek funding from benefactions and appeals. Most dramatically, by obliging the universities to charge overseas students on a full-cost basis we have given them an opportunity - to which they have responded with alacrity - to increase their private fee income. The next step forward - the most difficult politically, and potentially the most significant in terms of income generation - must be for the universities to recognise that there is additional private income to be generated from the sale of teaching services to home students. We have brought many in the universities to the brink of recognition of the necessity - indeed, the desirability - of this development. For our part, we must recognise, however, that it will be difficult for them to take this step - given past assumptions of national responsibility for the universities in Britain - without some kind of signal from Government.

IV: Expenditure: The University as a Responsible Agent

10. Alongside the disincentives to the generation of non-Governmental income, another of the pathologies of the nationalised system has been the weakness of incentives to discipline expenditure. When it is assumed that Government will make up the difference between income and expenditure at whatever level, only a (diminishing) sense of professional and institutional responsibility will hold back the growth of expenditure, or insist upon a strict control of the factors which make for higher expenditure. This is, I guess, why our international comparisons show such high relative unit costs, and such very favourable staff student ratios, in our university system compared with universities abroad.

11. Over the past decade, by the expedient of reducing the availability of Government deficit funding, considerable progress has been made in disciplining university expenditure, and the factors which give rise to it. The structures of university management have been strengthened, corporate planning has been developed, and there has been some progress in making pay arrangements and the terms of employment (academic tenure) more flexible.

12. We have not yet, however, reached the stage at which it is widely understood within the university system - and, indeed, outside it - that the expenditure of each university must reflect its income, within which income from the Government is only one element. I believe that this will only come by clarifying the ways in which Government enables the universities to earn income, along the lines set out in section III above.

13. At this point in the argument it is often objected that, given the history of national responsibility, the Government is tied into deficit funding of universities because it cannot allow competition and market forces to lead to the bankruptcy or closure of a university. I believe this to be an essentially theoretical objection: the demand for

university places is such that it ought to be possible for any of our existing universities, given the opportunity and incentive, to generate sufficient income to remain in being. This is not to say, however, that each university will always be able to generate sufficient income to meet all its expenditure aspirations. The problem is not, therefore, one of the potential bankruptcy of any university, but rather of its potential inability to generate sufficient income to live up to standards of expenditure which, within the nationalised system, have come to be increasingly homogeneous. Thus what needs to be more clearly understood, both within the universities and outside, is that a "de-nationalised" university system will necessarily be a more diversified one. I believe that this would be in itself a desirable development.

V: Responsibility: Towards Real Autonomy in the Universities

14. It is important to grasp that, within a nationalised university system, institutional autonomy is increasingly a merely constitutional artefact. Increasing dependence on Government funding has, inevitably, eroded the real autonomy of our universities, which was historically based upon a diversity of funding resources. The effect of this on the structures and ethos of the universities has demonstrably been corrupting: the kind of weaknesses identified by the Jarrett Report could not have arisen in institutions which had to earn their way in a market place.

15. More important, the habits of dependence bred by the nationalised system are also, in the longer run, intellectually and culturally corrupting. The erosion of the sense of institutional responsibility feeds into an erosion of the sense of individual academic responsibility; self confidence is diminished; aspirations are diminished; mediocrity becomes the norm. A graphic instance is Cambridge University's decision to prefer the comforts of collegiality to the pains of differentiating professorial salaries, explicitly recognising that this renounces the ambition to compete in salary terms with American universities. Competing, as all English speaking universities must, with the more dynamic market-driven universities of the United States, our universities are allowing themselves to seem increasingly second-rate - and that not simply for economic/financial reasons.

VI: Conclusion

16. Universities are vital institutions in modern societies, which are based on the organisation of intelligence. In Britain a particularly powerful and dynamic set of universities was built up in the 19th and early 20th centuries. That dynamism and power is, however, baffled and frustrated by the structures and attitudes which have grown

CONFIDENTIAL

up over the last few decades within the system of university nationalisation. To get the best out of our universities, Government and universities alike must rethink their relationship, and recast it on a new basis. This will include a diminished overall role for Government, combined with greater specificity in the role which Government does play; together with a greatly enhanced capacity for independence in the universities, based on the diversification of their sources of income and the strengthening of their sense of responsibility for their own destiny.



ROBERT JACKSON

10-3-89

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troversial figure then too. "He'd been hurt before his testimony [at the Iran-*contra* hearings]," says a White House official who is no Abrams fan. But fire him now? Not likely.

FRED BARNES

Our universities are the world's best.

HIGHEST EDUCATION

IN THESE DAYS when foreign economic rivals seem to be surpassing us in one field after another, it may be reassuring to know that there is one vital industry where America unquestionably dominates the world: higher education. Between two-thirds and three-quarters of the world's best universities are located in the United States. This fact has been ignored by the many recent critics of higher education in America. (We also are home to a large share of the world's worst colleges and universities, but that is beside the point.)

What other sector of our economy can make a similar statement? There are baseball, football, and basketball teams—but that pretty much exhausts the list. No one has suggested that today America is home to two-thirds of the best steel mills, automobile factories, chip manufacturers, banks, or government agencies. Our position at the upper end of the quality scale in higher education is unusual, may be a special national asset, and needs to be explained.

By two-thirds (perhaps three-quarters) of the best I mean that surveys of world universities rank American public and private institutions at the top. A recent exercise by Asian scholars, published in the *Asian Wall Street Journal*, produced the following rankings: 1. Harvard; 2. Cambridge/Oxford; 3. Stanford; 4. Berkeley; 5. MIT; 6. Yale; 7. Tokyo; 8. Paris-Sorbonne; 9. Cornell; 10. Michigan, Princeton. I attach no real importance to individual rank order. What does have validity, I think, is the group as a whole. And I believe that if this list were expanded to 20 or 30 institutions, the U.S. proportion would not decline. Columbia, Chicago, UCLA, Cal Tech, Wisconsin, and many others would find little competition abroad. Note also that the list contains a couple of dubious entries: Tokyo and the Sorbonne are probably mentioned among the top ten as a consequence of excessive Oriental courtesy.

Some may argue that the very notion of rankings or "the best" is invidious, crude, and meaningless. I do not share that view if we adopt a sufficiently broad interpretation of these terms. The universities we are considering lead the world in basic science research. They provide a significant share of the most competitive graduate programs. They are generally at the cutting edge—rather

blunt these days—of the social sciences. Students from all over the world, at all levels, seek entry in large numbers.

Why this happy result? Our national wealth, large population, government support especially of science have to be significant explanatory factors. The constructive influence of Hitler refugees undoubtedly was important in setting new standards of quality beginning in the 1930s. The American habit of private philanthropy remains crucial. These are influential factors, but in my opinion there are less obvious and perhaps more important considerations.

An unusual characteristic of American university life is its competitiveness. Institutions of the same class compete for faculty, research funds, students, public attention—and much else. That Harvard and Stanford, for example, actively recruit and compete for students—undergraduate, graduate, and professional—is quite incomprehensible to establishments such as Tokyo or Kyoto universities, where an entrance examination determines all. It is almost equally unusual in most parts of the world for one institution to hire professors away from another by offering a higher salary and/or better working conditions. In Japan, and to a lesser extent elsewhere, universities hire almost exclusively their own graduates. Inbreeding is rampant—a sharp contrast with most departments in top American universities.

Institutional competitiveness has some negative consequences—particularly if your university loses too many encounters with the market. The dark side includes too much movement by professorial stars from one university to another in relentless pursuit of personal gain, and a consequently lower level of institutional loyalty. Competition also leads to invidious comparisons among fields of study, with excessive advantages within the university going to those subjects where "market power" is strong (computer sciences, yes; English, no). Not least, competition can lead to a Wall Street-like mentality that focuses too much on short-term highly visible achievements at the expense of the long run and the unfashionable.

However, the benefits of American-style competition among universities outweigh the costs. It has prevented complacency and spurred the drive for excellence and change. Christopher Rathbone wrote in the *Times Higher Education Supplement* in 1980: "... Oxford is not obliged to compete. There are no challengers perpetually ready to depose Oxford from its pre-eminent position. Oxford ... unlike its American counterparts is not out to prove itself. ... This lends self-composure and dignity." These sentiments apply as well to Tokyo, Paris, and Cambridge, and they cannot describe any American university. We may lack self-composure and dignity, but we do achieve higher quality at the top.

AMERICAN PRACTICES also differ in the selection of faculty for "permanent employment," or tenure. Despite the ubiquity of security of employment in our society, faculty tenure at universities seems to be an especially vexing subject. Critics complain that teaching

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ability is ignored and that deadwood is encouraged to remain in place for many years. Without discussing these criticisms—and I do not agree with them—this much is clear: in our leading universities, the granting of tenure is taken with utmost seriousness. It is not merely a question of time. Tenure is awarded only after a long period of probationary service (usually eight years), and extensive inside and outside peer review; it is a highly competitive selection process. At Harvard we ask a traditional question: Who is the most qualified person in the world to fill a particular vacancy? and then we try to convince that scholar to join our ranks. We may reach the wrong conclusion, and we may not succeed in attracting our first or even second choice, but our goal is elevated. Details may differ, but in essence the process of achieving tenure is the same in our leading institutions—those that are included in two-thirds of the best. All of these schools correctly assume that the quality of the faculty is the most important factor in maintaining their reputation and position. The best faculty attracts the finest students, produces the highest quality research, gains the most outside support, etc.

It is not easy to generalize about practices everywhere else, but probationary periods are likely to be far shorter, there is less reliance on outside evaluations, and, of course, there is much inbreeding. Teachers and researchers can attain permanent status at low ranks—as lecturers and assistants—and may never attain senior status if their performance is mediocre. But these individuals remain in place for all too many years, which affects both atmosphere and average quality. Our American policy of “up or out” is rarely practiced elsewhere.

GOVERNANCE IS another area in which American universities are unusual. The uniquely large role of private higher education is a major factor, but not the entire explanation. Public and private university governance in this country are quite similar, and differ in an important respect from what might be called the “continental model.”

The American system is unitary. Ultimately one person—a president—is in charge. Typically, educational policy—curriculum, nature of degrees, selection of faculty, admissions, etc.—is initiated by or delegated to academics. But budgets, management of endowment, decisions on new programs, long-range plans, and similar matters are in the hands of a hierarchy headed by a president who is responsible to a board of trustees.

Two elements in this system are noteworthy. First, chairmen, deans, provosts, and similar levels of senior and middle management are appointed, not elected, and they can be dismissed. This is crucial because academic elections tend to result in weak leadership. What professors in their right minds would vote for a dean who advocated cuts in their departments? Second, relatively independent trustees serve both public and private schools, giving considerable protection from political interference even to state universities. We have a system of governance that permits non-consensual and unpopular decisions to be made when nec-

essary. We have learned that not everything is improved by making it more democratic. We also have learned that university governance functions best when conflict of interest is minimized.

There is no one pattern of university administration in the rest of the world, of course. But more often than not universities are state-run, under the direction of a ministry of education or some form of national grants committee disbursing government funds. Professors tend to be civil servants subject to many bureaucratic regulations; logrolling all too easily replaces competition. An elected administration—another common feature—ensures that leadership is weak: those who are strong and espouse change are unlikely to be popular favorites.

During the last 20 years, a form of democratization known as “parity” has become common in parts of Europe: decisions concerning universities are made by a board with an equal representation of students, staff, and faculty. In Holland, for example, the consequence has been an assault on the very notion of excellence in higher education. Professor Isaac Silvera, who taught physics at Amsterdam for many years, wrote recently: “The primary function of a university is teaching and research, but what seemed paramount in the Dutch system was to create a democratically structured institute with organization and rules that would promote the social contentment of the employees and students; only then would attention be focused on education and research.” And Nobel laureate Nicolaas Bloembergen added mordantly: “In a few years . . . the Dutch will even be unhappy if their soccer team wins the World Cup—that would imply excellence.”

I SUSPECT ANOTHER factor can help to explain why America is home to a disproportionate share of the world's finest universities: regional pride. It may exist elsewhere in the world, but not nearly to the same degree. Many of our best institutions—public and private—are clear expressions of local patriotism. The University of California, Stanford, Texas, and Duke are just a few of the obvious examples. In our large and decentralized country, each region wants its share of the best, and sometimes these ambitions are fulfilled. In less than a hundred years, with the help of a growing population and tax base, great local ambition, new wealth, and a wonderful climate, the state of California has created an astonishing number of universities with international reputations. And all are far removed from the traditional cultural centers of the Northeast. In America the pre-emptive power of Paris, Tokyo, or pre-war Berlin simply does not exist—thank goodness.

In higher education, “made in America” still is the finest label. My only advice is to add “handle with care,” lest we too descend to the level of most other American industrial performance.

HENRY ROSOVSKY

Henry Rosovsky, former dean of the faculty of arts and sciences at Harvard, is an economist specializing in Japan

PRIME MINISTER'S MEETING WITH VICE-CHANCELLORS, 13 MARCH

UNIVERSITY PAY

OBJECTIVES

1. To keep up the momentum towards a settlement of the present dispute which accords with Government interests, and to impress on the Vice-Chancellors the Government's longer-term objectives for university pay.

BACKGROUND

2. The Vice-Chancellors offered their academic staff 3% on the grounds that they could afford no more. The Association of University Teachers (AUT) rejected this and its members subsequently voted to refuse appraisal and to boycott examinations pending a better offer. The Vice-Chancellors sought an extra £57m in 1989-90 and £80m in 1990-91 to enable them to make higher offers to academic staff and others, including technicians, whose grading structure they wish to change.

3. The DES has today offered them, with the consent of the Treasury, additional funding for pay, of £37m, £40m and £43m over the next three years. These sums are offered on the conditions that

- (i) at least 1% on the academic pay bill will be used to widen differentiation, eg better pay for the best professors, discretionary increments for good lecturers blocked on the scale maximum;
- (ii) at least £5m (3.5% on their pay bill) will be used to buy better working practices from the technicians;
- (iii) the delivery of these selective elements will be monitored.

These elements would be in addition to general increases of about 6% for all university staff.

4. The Vice-Chancellors are now asking the AUT to call off their action. They know that this is a pre-condition of release of the Government money.

PRESS BRIEFING

5. It is desirable to have no announcement until we know that there is the basis of a deal between CVCP and AUT. The situation is fast-moving: we shall advise further on Monday as necessary.

LINE TO TAKE

1. Recent industrial action has damaged universities' standing. Must be called off before Government can release more funds.

2. We ask you to settle quickly with lecturers and technicians on terms consistent with the Government's offer, including more flexibility. Government will monitor delivery of the conditions it has placed on that offer.

3. For the longer term we want more differentiation in university pay to reward merit and market value; and more decided by the institution, less at the centre.

[If raised]

4. The Government will not offer any more money than it has already put on the table.

DEPARTMENT OF EDUCATION AND SCIENCE

10 MARCH 1989

AIMS

Quality in teaching and research, including the capacity to bring students to degree standard in three years, with negligible wastage.

Access to higher education for potential students from a much broader range of backgrounds.

Limiting the cost to taxpayer and ratepayer.

MEANS

Competition between universities (and polytechnics?), competition in quality and price, competition to attract students without arbitrary limits on numbers.

Effective use of the quantum of public money to achieve the aims of access and quality, rather than as an indiscriminate subsidy.

A POSSIBLE SOLUTION

- (1) Abolish the teaching element of block grant, local authority payment of fees, and the maintenance grant.
- (2) Allow each university to fix a level of fees in each subject, to cover the full cost of its courses, the fees to be the same for home and overseas students.
- (3) Use the money saved in (1) for a system of State Scholarships, to be awarded on merit but means-tested as to value, and intended as a contribution to both fees and living expenses.
- (4) Ask the UFC to set the ground rules for State Scholarships and allocate them between subjects, but delegate their award and detailed administration to universities.

This solution can be implemented within existing legislation, and within a cash limit.



RS

~~RS~~
 (letter only)

Prime Minister 4

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PRIME MINISTER

MATHS AND SCIENCE CURRICULUM

We set out down the national curriculum road two years ago for maths and science. Although it has been, at times, very bumpy the end result is a remarkable achievement. This is setting out, for the first time in English education, a structured curriculum in these two subjects. You will see that we have been able to be very specific for each of the ten levels covering the ages 5-16.

We are printing over 300,000 copies of each of these so that all teachers will be able to have a copy. This is really essential since we need the commitment and involvement of the whole teaching profession in this huge exercise.

KB
 DEPARTMENT OF EDUCATION AND SCIENCE

8 March 1989

University of London, Senate House, Malet Street, WC1E 7HU

From the Vice-Chancellor
Right Honourable
The Lord Flowers FRS

01-636 8000

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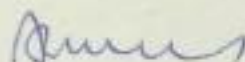
1 March 1989

Dear Mr ~~Turnbull~~

Further to your letter dated 22 February 1989, I confirm that I shall be pleased to attend the meeting at 10 Downing Street at 3.00 p.m. on 13 March 1989.

Sir Mark Richmond is preparing a paper which can be used as the basis for discussion.

Yours sincerely



Mr Andrew Turnbull
Principal Private Secretary
10 Downing Street
London SW1A 2AA

Griffiths

PROFESSOR GRIFFITHS

The Prime Minister has had the attached letter from Stuart Sexton making various complaints about DES implementation of education policy. I see that he has already spoken to you about at least one aspect of this. Could we perhaps have a word about how best to handle this letter?

PAUL GRAY

1 March 1989

73/DS

Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom

29 Tavistock Square London WC1H 9EZ Telephone 01-387 9231

From the Chairman: Professor Sir Mark Richmond FRS

In reply please quote: MHR/SAN

February 27 1989

Dear Mr. Turnbull,

Thank you for your letter of February 22. *Plat*

n I would like to accept the Prime Minister's invitation to come to 10 Downing Street at 3.00 p.m. on March 13th.

I think it is possible that the paper you mention in your letter will now come from me; and I will be consulting Lord Flowers and Sir Patrick (and indeed my other colleagues) before writing it.

Yours sincerely,

Mark Richmond

Mr. Andrew Turnbull,
The Principal Private Secretary,
10 Downing Street,
London
SW1A 2AA

EDUCATION: Policy PT20



From the Vice-Chancellor

Dr E. S. Page



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DDI (0734) 318000

27 February 1989

Mr. Andrew Turnbull,
Principal Private Secretary,
10 Downing Street,
LONDON SW1A 2AA.

Dear Mr. Turnbull,

Thank you for your letter of the 22nd February with the invitation from the Prime Minister to meet her on the 13th March.

I look forward to being present.

Yours Sincerely,

E. S. Page

EDUCATION: Ponce P.T.O.



File 21

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

27 February 1989

Dear Tom,

HMI ANNUAL REPORT

The Prime Minister was grateful for your Secretary of State's minute of 22 February enclosing the HMI Report for 1987-88, which she has seen and noted.

I am copying this letter to the Private Secretaries to members of E(EP) and Sir Robin Butler.

Yours,
Paul

PAUL GRAY

Tom Jeffery, Esq.
Department of Education and Science

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IEA

EDUCATION UNIT

25 FEB 1989

Warlingham Park School,
Chelsham Common,
Warlingham,
Surrey CR3 9PB

Director : Stuart Sexton

Fax 08832 5501
Telephone 08832 6844

22 February 1989

Rt Hon Mrs Margaret Thatcher MP
Prime Minister
10 Downing Street
London SW1

Dear Prime Minister,

Whilst no longer Special Adviser at the DES, I continue to take an active, detailed part in current educational development from my current position of Director of the Education Unit of the Institute of Economic Affairs. I am also now the prospective parliamentary candidate for the Workington constituency (Dale Campbell Savours MP).

Might I draw to your attention three concerns; I give you a brief paragraph on each but could of course amplify to whom ever might wish to follow them up.

EEC - 1992 - Schools Harmonisation

I addressed a conference in Milan on 20 February about education reform in Britain. Also sharing the platform was Dr Domenico Lenarduzzi of the EEC Commission (Social Affairs and Education). He spoke of "harmonisation of schools", of a common culture, of common curriculum, and of "hundreds of directives from Brussels" to implement such "harmonisation".

I objected strongly, and publicly, that neither the Treaty of Rome nor the Single Act had any legal requirement whatsoever for "harmonisation of education". The essence of current British education reform is de-centralisation to the schools themselves; we were not going to exchange control by officials in London for control by officials in Brussels.

Dr Lenarduzzi backed down, agreeing that there was no legal requirement, but that nevertheless it would be better if we had harmonisation, whatever that might mean.

Prime Minister our recent education reforms could easily be undone if we let the Commission get away with "directives" on education.

cont/...

IEA
The Institute of Economic Affairs

Registered Office : 2 Lord North Street, Westminster SW1P 3LB
Registered No. 755502 Registered Charity No. 235 351

Assessment of Children at 7, 11, 14 and 16

I have already given a briefing on this to Brian Griffiths.

It seems that Mr Philip Halsey the chief of the Secondary Examinations and Assessment Council is taking us down an unacceptable and extremely expensive road. Through him the Government has placed a contract amounting to £6 million to develop "assessments and attainment targets" for 7 year olds, and that just for the 7 year olds. Mrs Claire Burstall of the NFER has been advising the Government as to what such assessment should be, and is now the recipient of a major part of that contract. She has, it would seem, recommended the questions to be asked, and now contracted to give the answers. The assessment will be internal, teacher based, subjective. It will also be highly expensive both initially and ongoing.

The alternative is computer-based, external assessment of numeracy and literacy (and nothing else), the kind of external computer based systems already being used by the Ministry of Defence, and developed for them by the Polytechnic of Plymouth in conjunction with the Education Testing Service of America. Such would be objective, external of the teachers, cheap to apply, and with no annual updating costs, the software can produce further tests to the agreed formula at negligible extra cost. Plymouth could have offered a scheme for £250 thousand instead of six million.

By the time targets and assessments for all the intended year groups have been developed, the Government risks embarking upon an exceedingly expensive programme, exceedingly expensive initially and continually, and yet one which will still not give us external objective testing of literacy and numeracy.

Grant Maintained Trust

Many persons from schools thinking of opting out contact me having failed to get satisfaction from the Grant Maintained Trust. The idea of the trust was a good one, but I do not think it is being as effective as it could be, and the problem is not money, it is the persons involved. Of course I know Andrew Turner from when he worked at the education desk at Central Office, and then for Norman Fowler at DHSS. He is a nice enough chap, but I question whether he has the grasp, the knowledge, or the leadership to make the Grant Maintained Trust the force that it could and should be. Subsequent appointments by Andrew of Adrian Pritchard (Finance and Management Adviser), Nigel Craig (a local Hampshire solicitor) and Keith Kirkland (Vector Business Developments of Titchfield in Hampshire) seem to be just friends of his who again do not seem to have the expertise needed.

Grant Maintained Trust are now paying Vector Business Developments to hold a conference of Heads of would be Grant Maintained schools on 8

April to be held at the London Oratory, about 20 persons in all. I question why GMT could not do it for themselves, why the list of speakers is so poor, and why future GM schools are not invited to form a Grant Maintained Schools Association comparable to the old Direct Grant Schools Association.

I hope you might be able to put a bomb behind them to get their act together. I do my best from the IEA, speaking at schools around the country and advising governing bodies, but I do not have the authority that the Grant Maintained Trust has.

I know you have much more important matters of concern to attend to, but I hope you might be able to give a push in the right direction for a solution to the above three.

Yours truly,
Stuart Sexton

Stuart Sexton



FILE PM

cc Sir David Hancock
DES.

cc Duty
clerk.

10 DOWNING STREET
LONDON SW1A 2AA

From the Principal Private Secretary

22 February 1989

Dear Sir Mark

Sir David Hancock has spoken to you about the meeting the Prime Minister proposes to hold with Vice-Chancellors to discuss current issues relating to the universities. This letter is to confirm the Prime Minister's invitation and the arrangements for the meeting. It will be on Monday 13 March at 1500 and is scheduled to last approximately one hour. I understand that Lord Flowers and Sir Patrick Neill will be preparing a paper which will serve as the basis for the discussion.

The other participants at the meeting will be:

- Lord Flowers
- Sir Patrick Neill
- Sir John Kingman
- Professor Graeme Davies
- Dr. Ewan Page

The Secretary of State for Education and Science
Lord Chilver
Sir Peter Swinnerton-Dyer

Please could you, and the other participants, contact the Duty Clerk at No.10 (tel. no. 930-4433) to inform him or her how you propose to arrive. They will advise on access/parking for cars and will make arrangements for you to get into Downing Street.

I am copying this letter to those listed above.

Yours sincerely
Andrew Turnbull

ANDREW TURNBULL

Professor Sir Mark Richmond, F.R.S.

KK



copy
(letter only)

mt

Prime Minister

PRIME MINISTER

You will want to be aware. Brian feels that the 1st 66 paragraphs are rather bland, but you may wish to glance at paras. 67-76. There is probably nothing here a draft you need to comment on this stage. Content simply to note?

HMI ANNUAL REPORT

Attachment
REC 6 2/2

You will recall that, with your agreement, I announced in October 1987 the move to a new style of HMI annual report which would draw on a whole year's HMI observations rather than a one-term survey. The Senior Chief Inspector has now submitted to me his first report in the new style. It covers the 1987-88 academic year, and a copy of it is enclosed.

The new report is a general survey of the state of education rather than a report about expenditure, and comments on levels of resources are closely related to their impact on the teaching and learning observed. It therefore gives a much more rounded view and concentrates on outputs rather than inputs.

The new style report is a great improvement on its predecessor. The report itself contains many positive observations, although it highlights certain areas of concern many of which we are already in the process of tackling.

The report is SCI's independent view, which I publish in full as received. I intend that the report should be published on Tuesday 28 February. I will issue a factual Press Notice, prepared by HMI, covering the report and also one covering my comments in general terms on its contents. Copies of both press notices are attached.

I am copying this letter and the enclosures to other members of E(EP) and to Sir Robin Butler.

KB

KB
DEPARTMENT OF EDUCATION AND SCIENCE

22 February 1989

DRAFT PRESS NOTICE

Education Secretary Kenneth Baker issued the following statement on the HMI Annual Report, covering the academic year 1987-88, which was published today. It is a first report in a new style which was announced in October 1987.

"A key finding in this independent report by the Senior Chief Inspector is that the education service is well placed to face the future with confidence. _____

I welcome the good news in the report about standards of teaching and learning. I am delighted that pupils' motivation and teachers' expectations are increasing. This is continuing clear evidence of the benefits resulting from the GCSE.

I share the Inspectorate's concerns about whether the education service is getting the most out of the resources invested in it by taxpayer and ratepayer. SCI points out, as he has done in previous reports, that "most of the inappropriate provision and shortages of materials and equipment observed in institutions stem from either inadequate management or poor identification of needs and priorities at the institutional or departmental level rather than from an overall lack of funds".

Our reforms will do much to help. Local financial management and the new competition brought about by open enrolment and the establishment of grant-maintained schools all have an important part to play. They provide incentives to institutions to focus money on need and to tighten their management of resources.

HMI have also drawn attention to a number of specific issues facing the education service, particularly the need to ensure a sufficient supply of suitably qualified and competent teachers. The Government is committed to tackling this problem. I am pursuing policies which aim to ensure that education does not suffer for lack of good teachers.

The report comments, too, on the appearance of accommodation in some schools and colleges. Our expenditure plans include provision for continued increased spending by LEAs on repairs and maintenance as well as for the extension of the schools improvement programme started last year.

The report is about the state of the education service in England. It is the Senior Chief Inspector's Report to me and is published exactly as I received it. It provides an independent view of the nature, quality and effectiveness of the education provided in schools and colleges in the year in question. It deals with the academic year 1987-88 and thus observes the education service in the year in which the Education Reform Act became law. The policies in that Act are set to raise standards further."

**A Report by
HM Inspectorate**

STANDARDS IN EDUCATION

1987—88

The Annual Report of
HM Senior Chief Inspector of Schools
based on the work of HMI in England

February 1989
Department of Education and Science

ANNUAL REPORT: 1987-1988

1. INTRODUCTION

1. In July 1987 the Secretary of State for Education and Science announced that the report which Her Majesty's Inspectorate (HMI) in England had for several years carried out on the effects of Local Education Authority (LEA) expenditure policies for education on the quality of provision and response¹ was to be superseded by an annual report from the Senior Chief Inspector. Unlike its predecessor, which was based on one term's inspection only, the new report would comment on the state of the education service in England on the basis of the findings of a full year's inspection by HMI.

2. This is therefore the first report of its kind. It covers the academic year from September 1987 to August 1988, and draws on the inspection and other activity of HMI and on the reports it has published during the year. (A selection of those is listed in the Annex; a full list can be obtained from the Department of Education and Science (DES).) The work of HMI is designed to assess the quality of educational provision and standards of work and to report to the Secretary of State in ways that can be used to inform policy-making. It aims also to evaluate how national and local policy initiatives are working out in practice and to report as it finds. As well as an extensive programme of inspections in England, HMI has looked

¹The announcement followed the publication of the last report in this series, entitled "Report by Her Majesty's Inspectors on LEA Provision for Education and the Quality of Response in Schools and Colleges in England: 1986", DES, 1987 ["LEA Provision"]

at important educational developments in other countries; organised and conducted a number of short courses for teachers; liaised with other governmental agencies; and worked as assessors to a range of major national educational enquiries, working groups and agencies. The Annex gives a summary of the main activities carried out.

3. The academic year 1987-88 was both lively and controversial for those engaged and interested in education. Within the space of a couple of months at the end of it, well over half a million candidates completed their course work and sat their examination papers in the first General Certificate of Secondary Education (GCSE), and the Education Reform Bill completed its passage through Parliament, to become the Education Reform Act (ERA) of 1988. The impact of the latter, for all stages of education, will become increasingly influential over the next few years and will be subject to extensive evaluation, locally and nationally. Effects of the GCSE are already discernible. In reporting on its first years², we judged that the new courses had markedly increased pupils' motivation; improved both teaching and learning; and helped to raise teachers' expectations particularly of pupils of around average academic ability. Despite administrative hiccups, some of which were serious, the strong and sustained commitment to the GCSE by teachers and, perhaps more importantly, by pupils has led most of those engaged in it to regard it as a good examination successfully introduced. There are still things to be done to improve the GCSE and its administration but many of its principles will underpin the development of the National Curriculum and its associated assessments.

² "The Introduction of the General Certificate of Secondary Education in Schools, 1986-88" ["GCSE"]

4. All the reforms and innovations will need to influence the training of new teachers; the members of the new governing bodies being established; and, most important, all teachers currently in service. Consequently, the types and availability of education and training, initial and in-service, will be matters of debate and will require action. The second survey of the work of newly trained teachers in primary, middle and secondary schools in England and Wales³ was published in the autumn of 1988. The new teachers it reported on were mainly trained before the Council for the Accreditation of Teacher Education (CATE) began to influence courses. The report concluded that, while most new teachers were coping at least satisfactorily, about a fifth were not. In addition, the support given to probationary teachers through planned induction programmes was often inconsistent and for many simply non-existent. Many initial training courses equipped teachers inadequately for the full range of classroom demands, even allowing for the fact that as new teachers they would still have much to learn. The problems of fitting everything into a limited period of time were particularly pressing on the one-year post-graduate certificate courses (PGCE).

5. Change, and the preparation for change, exercised further and higher education (FHE) almost as much as the schools. Both further and higher education were much taken up with concerns about quality, student numbers, access and funding; in higher education (HE), the imminent establishment of the Polytechnics and Colleges Funding Council (PCFC) and preparation for incorporation were particularly important issues. The ERA also calls for changes in governance and funding, and the major survey of further education (FE), "NAFE in Practice", was completed with the publication of the report on tertiary colleges. The National Council for Vocational Qualifications (NCVQ) continued its accreditation work, but as

³"The New Teacher in School: A Survey by HM Inspectors in England and Wales 1987", HMSO, 1988, £4.50 ["New Teacher"]

yet has had little impact on the management and implementation of FE courses. An inspection exercise in HE, involving three polytechnics, was completed in 1988, and reports were published on each. Although very different from each other, manifesting a range of quality across their courses, they were judged to be mature institutions ready to take on much greater responsibility for their own destinies and standards.

2. STANDARDS OF WORK

General

6. Most of the work seen by HMI in both schools and colleges was judged to be satisfactory⁴ or better. That important finding should be borne in mind when this report deals, as it must, with the shortcomings which exist. Overall, there is still too much variation both in what is provided and in its quality. Similarly, although there is an increase in teaching which encourages higher standards of learning through the active participation of pupils and students, it is unevenly spread through the various sectors of education. Most primary schools deal effectively with the basic skills of literacy and numeracy but much less satisfactorily with the rest of the curriculum. In secondary schools, the introduction of the GCSE markedly improved the quality of teaching and learning, particularly in fourth and fifth year classes. More generally, course work and its continuous assessment, important features of the GCSE, are now established in many courses in schools and colleges, with generally beneficial effects.

7. The attitudes, behaviour and motivation of the substantial majority of pupils and students at all levels of education are good. Educational institutions are for the most part

⁴In making their assessments of the quality of work, HMI use a 5-point evaluative scale, with grades ranging from excellent to poor; 'satisfactory' is the descriptor generally used for the mid-point of the scale.

orderly communities in which good standards of behaviour and discipline prevail. However, attendance rates in secondary schools are too variable and those of upper secondary pupils in some areas are a cause for serious concern. Poor attendance has adverse effects generally, but particularly on the completion of course work. In FHE, students' motivation is often excellent, but some drop-out rates, especially among part-time students, are worryingly high, yet are rarely examined to seek ways of reducing them.

Primary Schools
& Early Years

8. All forms of early years provision continued to increase. The largest area of growth was the entry of 4 year olds into reception classes. Education and care in Nursery Schools and classes are often good, but in reception classes both frequently give cause for concern although there are signs of improvement.

9. In maintained primary schools standards in basic language work are generally sound in that most pupils are taught the early stages of reading and writing systematically. Indeed, there are discernible improvements in both the quality and range of written work, due partly to the influence of the National Writing Project and also to the increasing use of word processors for drafting and re-drafting. Unfortunately, there is still far too little stimulation and challenge to pupils to read more widely once fluency has been established and to develop oral skills.

10. In mathematics, basic standards are satisfactory. Many schools are trying to broaden their approaches to enable pupils to use their mathematical skills more widely and to increase the scope of mathematics programmes. Advisory teachers in some LEAs are helping to develop the quality of mathematical work. Often, however, skills are not sufficiently applied to practical tasks for competence in them to be secured, and the more able pupils are not sufficiently challenged or stretched. The proportion of primary schools with scientific work judged to be of a satisfactory or better standard has risen significantly since our 1978 National Primary Survey. Weaknesses in the work often stem from teachers' lack of scientific knowledge rather than from difficulties over methods of teaching science.

11. If primary schools are to respond effectively to the requirements of the National Curriculum, as they are progressively introduced from September 1989, they will need to adjust the balance of teaching between the core subjects and the other foundation subjects. In many schools, history, geography and sometimes religious education are incorporated into topic work. Although sometimes of high quality, it more often than not lacks continuity and progression, or any serious attempt to ensure that adequate time and attention are given to the elements said to comprise the topic. The presence and quality of art, drama, music and physical education are unduly dependent upon the

interest of individual teachers. Consequently, there is a wide variation in what is taught and in what is learnt.

12. Weaknesses in assessing and recording pupil's performance often contribute to a lack of pace and progression in primary schools. Those weaknesses are especially found in topic work, but work in the core subjects of English, mathematics and science also needs to be informed by better assessments. Almost all primary schools use standardised tests, usually in reading and mathematics. However, schools rarely use the information from such tests to assess pupils' needs and plan work so that pupils of varying abilities can all progress as they should.

Secondary Schools 13. In maintained secondary education, standards are improving for most groups of pupils, but slowly and unevenly. Weaknesses are most marked in the work of pupils of just below average attainment. Sadly, that was so both in the 1978 National Secondary Survey Report and in the report of the cycle of inspections⁵ which took place between 1982 and 1986. National initiatives such as the GCSE and TVEI have played a large part in the improvements. Their impact has been greatest in Years 4 and 5, but some effects are noticeable also in Years 1 to 3. The GCSE has encouraged many beneficial changes in teaching and learning. Four lessons out of five were judged to be satisfactory or better in our

⁵"Secondary Schools, an HMI Appraisal", HMSO, 1988
["Appraisal"]

recent report ["GCSE"], a higher proportion than is usually reported in our inspection findings.

14. The greatest change has been in the quality of oral work; 60% of lessons are now judged satisfactory, compared with 40% in the recent cycle of inspections ["Appraisal"]. In many schools pupils have more opportunity for sustained talk in a variety of groupings and for different purposes. For pupils of average ability and above, the GCSE has also improved the range and quality of written work. Nevertheless, there is still far too much writing with no real purpose or challenge. In particular the pupils whose writing skills are poor, and who most need to be enthused and given some objective to aim at, often spend too much time copying and doing routine exercises. While most pupils can read satisfactorily, in many schools they are rarely called upon, nor given opportunities to read a range of books of different kinds.

15. There are also positive features in mathematics. Practical investigation, in which pupils are challenged to think mathematically, is now more common. However, as in primary schools, far too much time is still spent on practising basic numerical skills and far too little on applying mathematics to a range of situations.

16. Most work in science is satisfactory. In an encouragingly high proportion of lessons

pupils design and carry out experiments and report their findings orally and in writing. Again, the GCSE has had beneficial effects by encouraging more and better practical work in science in years 4 and 5.

17. Similarly, for those pupils who take music and the other arts subjects, the GCSE has promoted practical skills and personal achievement. Those areas of the curriculum are nevertheless still generally under-valued and under-provided for, and pupils' aesthetic responses and creative expression are relatively poorly developed.

18. The extension of the Technical and Vocational Education Initiative (TVEI) provides financial support to an increasing number of schools, although the money available to each school is now substantially less than in the early years of the scheme. Support from TVEI has been particularly helpful in business studies, information technology (IT) and, to a lesser extent, media studies and the creative arts. Where TVEI courses have enabled pupils to exercise initiative and responsibility for their own learning, they have often achieved high standards of understanding and skill. Links with industry and commerce are valuable in themselves and in encouraging greater interest, activity and achievement more generally. The Lower Attaining Pupils' Project (LAPP) has helped to promote pupils' personal and social development and oral skills, but has had little positive effect on

raising the academic standards of low-achieving pupils. This is a problem that is complex and long standing, and unlikely to be solved quickly or if only dealt with in the last two years of compulsory education.

19. There has been a continuing trend towards including a greater number of subjects in the common curriculum of all secondary school pupils aged 11 to 16. In particular, many schools now provide balanced science for all pupils in Years 4 and 5, often leading to a dual award in the GCSE. Numbers taking a modern foreign language at this stage have also risen, although it is rarely part of the curriculum of all pupils. In the fourth and fifth years there has also been an increase in the number of modular courses, although they are still comparatively rare. Their attractions are that they may make for increased flexibility; facilitate the setting of short-term learning goals; and allow a wider range of what is provided, thus catering for varied interests. On the other hand, modular approaches in practice often result in fragmented curricula and disjointed individual programmes that deny continuity and progression, and do not provide a clear overall sense of direction for pupils, or for their patterns of study and learning.

20. Very few schools cope satisfactorily with cross-curricular themes and issues. Generally they fail to plan and co-ordinate pupils' experience in those aspects of education to which various subjects may

contribute. If the National Curriculum is to bring about more effective provision of, for example, environmental and health education, clear attainment targets and programmes of study will be needed, identified where appropriate within the core and foundation subjects, as well as much improved management of the whole curriculum by schools. Personal and social education is dealt with in various ways, but increasingly through timetabled programmes, particularly in the upper secondary school. The best courses respond effectively to pupils' personal needs and relate them to the wider social, economic and political world. Counsellors, careers officers and tutors can and do play an important part in encouraging and assisting pupils with their studies, but their tasks and responsibilities are often insufficiently well defined for them to be as effective as they could be.

Sixth Forms

21. Generally, the quality of sixth form work is satisfactory. However, in more than half the sixth form lessons observed in the 1982-1986 cycle of inspections ["Appraisal"] students played little active part and were too rarely stimulated or stretched by scholarly and challenging work. Changes in the courses available continue. Advanced Supplementary (AS) level courses have been introduced - on a modest scale, but in an increasing proportion of schools. Students tend to choose AS courses in a field related to their Advanced (A) level subjects, or in general studies; there has so far been little

take-up of subjects in contrasting areas. The Certificate of Pre-Vocational Education (CPVE) in schools tends to attract students with relatively low achievement at 16+; some courses are designed for those with special educational needs (SEN). Although some schemes are vocationally specific, most CPVE courses in schools are related closely to particular institutional strengths and constraints, the latter of which include inadequate expertise or resources to mount vocational studies. The quality of students' learning in CPVE courses shows some improvement over earlier years. Although many students are well-motivated, they are not always clear about the best path to take afterwards, and some subsequently enter vocational courses at the same level as those who have left school at 16+, which hardly serves as an encouragement to others to take the course in subsequent years.

Special
Educational Needs

22. The quality of the work of children with SEN both in special and ordinary schools is very variable. In special schools, relationships are generally good and there is some work of high quality. This often depends on close cooperation by all those involved with the pupils. For example, in some schools catering for pupils with multiple handicaps there is excellent work in developing communication skills based on individual pupil programmes prepared by class teachers, speech therapists, classroom assistants and house-parents. However, much work is insufficiently demanding and underestimates pupils' abilities; the curriculum lacks breadth, and

there are shortages of equipment for specialist work, largely as a result of the school's perception of what it needs. Despite that, opportunities for pupils with moderate learning difficulties to study science have improved and there are some encouraging developments in what they achieve.

23. The trend to integrate pupils with moderate and severe learning difficulties into ordinary schools has left many special schools with problems to cope with. These centre on the nature of the pupils the special schools are left with. In effect their pupils are now a much more seriously and multiply-handicapped group, as those judged able to cope in the ordinary schools are withdrawn and as advances in medical practice have enabled more seriously handicapped children to survive.

24. In ordinary schools, pupils taught in withdrawal groups generally do work that is well matched to their abilities. The main weaknesses are in linking that work with what is done by those same pupils in mainstream classes and subject groups. For SEN pupils working in ordinary classes with in-class support, an increasing trend, standards are still uneven. Where they are good, a key factor is the effective joint planning of the children's work by all the teachers concerned. There are some examples of the successful integration of even severely handicapped children into ordinary schools. However, the careful planning and in-service training

required are often lacking, and fully successful examples of such integration are rare.

25. Beyond the age of 16, the provision for students with special needs has increased significantly. While some students aged 16 to 19 take extension courses in special schools, the development of provision both for older adolescents and for adults with special needs has occurred mainly in colleges of further education. The work is of variable quality, and much good work takes place where there is one tutor with the responsibility for coordinating special needs teaching across the college and for the liaison with external agencies. A common feature of poor work is the failure to adapt the teaching to the individual needs of students of different levels of ability. Generally the students' abilities, particularly in practical work are often underestimated by their teachers.

Further Education 26. In FE the quality of teaching and learning and the standards of student attainment are generally satisfactory. Our survey of the work of tertiary colleges, ["FE in Practice"], for example, found that over 80% of the classwork was satisfactory or better. The best work is characterised by a variety of learning activities which give students scope to plan and manage their own work and which engage them in investigation, decision-making and problem-solving. By contrast in poor work, there is an over-reliance by teachers on exposition, which does

not enable students to participate adequately and does not stretch them sufficiently. Continuous assessment is now well-established as a feature of many courses, including the GCSE. Through this mode of assessment, students identify their strengths and weaknesses and teachers can review their objectives for the various stages of the course. In some instances, however, assessment is overly general and too lacking in detail to be fully informative.

Higher Education

27. In HE, the great majority of students in the institutions inspected achieve appropriate standards. In better courses, project work is demanding and often related to the research interests or industrial experience of staff; students undertake extended writing assignments, including a variety of problem-solving exercises. However, the range of work is sometimes too narrow, giving students insufficient opportunity for varied research or practical activity. Overall, about 80% of classes were judged to be satisfactory or better and the proportion was higher in the three polytechnics inspected. Most seminars and group work have realistic learning objectives, but lectures are less good in that students are rarely able to explore or challenge what was said in any constructive ways. Unsatisfactory outcomes are usually the result of poor preparation by the students and over-large seminar or tutorial groups. Essays and other assignments are carefully assessed, but tutors' comments often do not help the

students to identify and correct their weaknesses.

Adult and
Continuing
Education

28. In adult and continuing education, there is some work of excellent quality, especially some of that for unemployed adults and the access courses designed to widen the take-up of higher education. Students' previous experience is often used positively and some PICKUP courses are tailored carefully to meet individual needs. New courses have been introduced successfully, including courses in agricultural colleges on landscape contracting and computerised farm management, and the work in community colleges is often of a high standard.

29. There are also noteworthy developments in residential courses, education for women and provision for the unemployed. There are some positive responses to the specific educational needs of parents, the elderly and adults requiring basic literary and numeracy. Nonetheless, there is a need for more INSET provision geared to the needs of adult learners. The increase in access courses has highlighted the need for staff to be able to guide and counsel adults, as distinct from 16 to 19 year-old students, as well as to oversee their progress and consider their intended destinations.

Youth and
Community

30. In youth and community, the variable quality of young people's response often reflects the unevenness of what is provided. High quality work occurs in a wide variety of

contexts and with many different groups including young drug misusers; the young unemployed; homosexual young people; the homeless; and physically disabled young people. The best work is characterised by a sound assessment of needs and clear objectives, adequate resources and accommodation and good management and individual skills. Too often, however, young people are insufficiently enthused, challenged or stretched because their programmes and activities are not differentiated to meet their particular needs.

Initial Teacher
Training

31. Since Circular 3/84 and the establishment of the Council for the Accreditation of Teacher Education (CATE) there has been a considerable change for the better in initial teacher training (ITT) courses. In most there is now a much improved balance between theory and practice both in what the students do and in the experience of their tutors. In the best courses tutors now have up-to-date experience of teaching in schools and the links between what the students do in lecture rooms and their work in the schools are close and explicit. A few institutions provide outstanding examples of sound innovation and good practice and many others seem set to follow suit.

32. Most teacher training institutions have worked hard to create effective working partnerships with LEAs and schools. As a consequence there is more and better school-focused training in the system. But these

developments are coming under some strain, as to be successful they call for considerable time and energy from local advisers, heads and teachers. The necessary conditions for such success, namely the time and energy of local advisers, heads and teachers, were not allowed for in planning the changes in ITT. Success in the past has to a large extent depended upon the goodwill of the teachers and the relationship between schools, LEAs and colleges. That goodwill is put to the test as the greatly increased demands which have arisen from the INSET for the GCSE and the ERA make it difficult for schools to justify releasing teachers from other duties to work with ITT institutions in selecting and training students.

33. The insistence upon two years' academic study of at least one subject of the curriculum has brought some much needed rigour to that aspect of ITT, especially for intending primary teachers. The change is generally welcomed by those receiving the newly trained teachers and increasingly in the colleges, although there remains hostility to it among some primary teacher trainers. Most students now acquire by the end of their training a basic understanding of the primary curriculum and a reasonable repertoire of teaching styles. The main exception remains science in which there are weaknesses in ITT primary courses and in the understanding and competence of the students. In secondary training courses there is effective work in different subjects, characterised by a careful

match of what is done to the needs of the students and demands of the job. In particular, the shortened courses designed to attract mature students are working well.

34. Generally ITT students respond confidently and enthusiastically to the demands made of them. They become proficient at relating their subject knowledge, understanding of recent research findings and pedagogical theory to the realities of the children and schools they meet on teaching practice. But recent reports reveal that some of the serious weaknesses which emerged from the "New Teachers" report persist. Most serious are the relative lack of preparation in organising and managing learning; in the assessment and recording of pupil's progress; in understanding the ways in which children learn and develop; and in dealing differentially with different levels of ability and interest. Courses in ITT in general, but especially the one-year Post-Graduate Certificate in Education (PGCE), face a serious quarts-into-pint-pots dilemma. Already there is too little time available for all that needs to be done. That time is further squeezed by the desirable and much needed increase in the time given to practical teaching experience in schools. Despite those problems, the last year or so has seen marked improvements in the quality of ITT. It will be important to maintain the emphasis on quality even against the background of supply problems we are likely to face over the next decade.

3. TEACHERS AND TEACHING

Recruitment and supply

Primary Schools

35. While nationally there does not seem to be a shortage of people wishing to become primary teachers, a number of LEAs are having difficulty in recruitment, exacerbated by a rise in pupil numbers among the youngest children. There are acute shortages in inner London and some outer London Boroughs, coupled with a rapid turnover of teaching staff. Those and a number of other authorities are finding particular difficulty in recruiting heads and senior teachers. The notion of specific subject teaching shortages has not been applied to primary education, except in relation to middle schools where there are shortages in various subjects, including modern languages. However, given the national curriculum, there is little to be gained in maintaining the myth that all primary teachers are the same. They are not. A broad, balanced primary curriculum calls for a teaching force containing competence and understanding across a range of subjects. The introduction of the National Curriculum will reinforce that requirement. That being so, primary education is critically short of teachers with expertise in science, technology and mathematics.

36. The main ways of coping with such difficulties are through initial and in-service education and training and by deploying key teachers to make the most of their expertise. Primary initial training

courses now include a heightened concern with subject competence and are setting out to tackle the problem of shortages in specific areas. But there are serious difficulties both about INSET and about using primary scientists and mathematicians as subject consultants in schools. Those difficulties arise mainly because in most primary schools the planned non-contact time of the teachers averages 4%, but, in practice, most teachers teach for 100% of the time available. For heads the average is 50%, but those in small primary schools are nearly always responsible for a class and have as little as 10% non-contact time to exercise leadership and manage the school. In those circumstances it is unsurprising that there are serious worries about INSET which are related in part to fears that it may not be possible to provide it and that, even where it is available, problems of cover, and the extensive teacher absence involved, may adversely affect continuity and progression in teaching and learning.

Secondary Schools 37. Some similar problems exist in secondary education, sometimes exacerbated by the continuing impact of falling rolls. As a consequence an increasing number of authorities have begun to redeploy teachers, and in some cases there has been a reduction in promotion opportunities, especially for teachers on the main professional grade. In areas where the cost of living is highest, such as the inner and outer London Boroughs and the home counties, recruiting teachers is an ever-growing problem and some schools are

becoming more and more dependent on probationary and temporary teachers. Specialist teacher shortages are most severe in mathematics, science and craft, design and technology (CDT).

38. Although the average proportion of the timetabled week which teachers spend in teaching classes has declined over the last two years, by almost 3% to nearly 76%, the range of demands on teachers, over and above teaching, has risen - especially through work connected with the GCSE and the Local Education Authority Training Grants Scheme (LEATGS). Heads of department in particular often have too little time allocated for these duties, which is responsible in part for weaknesses in management at that level. The problems related to supply cover are serious, as in primary schools, and are increasingly leading to an unwillingness by heads and LEAs to support teachers' in-service requests.

Further Education 39. Staffing in FE is generally satisfactory, but some LEAs have high levels of temporary and part-time teachers. Occasionally there is a mismatch between the staff available and those required. For example, there is still an overall surplus of engineering lecturers as a result of the rapid decline of craft apprenticeships and associated day release. An increasing number of colleges have, however, been successful in re-training such teachers or deploying them effectively to other areas of work.

Higher Education

40. In HE, staffing levels have reached a steady state. 'New blood' appointments on a significant scale were made only for computing and hotel and catering courses. In general, there is too little mobility, and the average age of staff is rising. Most are appropriately qualified to teach in HE and many are undertaking research, scholarship, consultancy or professional activity. There are many examples of effective staff management, but staff development is not so satisfactory. Links with industry and the professions are reasonable, but lack of recent field experience is sometimes a weakness. That is true also of some long-serving tutors in ITT institutions, although staff development policies are now enabling many staff to renew and extend their classroom experience. Staffing levels in ITT are generally appropriate, but there are shortages of expertise in some areas such as special needs and humanities. There are inadequacies in the management of staff and some lecturers left to their own devices find it difficult to apportion their time appropriately between teaching, supervision, renewing professional experience and research.

Youth and Community

41. The work of many of those working in the youth service is of high quality and commitment, and hence young people derive great benefit. In response to difficulties in some areas over the recruitment of trained youth workers, and to draw on the skills and strengths among the young people living in inner cities, on-the-job training programmes

are to be funded under the ESG arrangements. Such schemes should prove beneficial if they arise from current good practice, are imaginative, and are capable of replication if successful.

Staff Development and In-Service Training (INSET)

The Management of INSET

42. The introduction of LEATGS has brought substantial changes to the organisation, planning and financing of INSET. One outcome is that all LEAs now have written statements on staff development and have created various structures for managing INSET. Although there is considerable variation in the quality of the management, some two-thirds of LEAs have systems which are satisfactory. In the others, weaknesses include a failure to identify needs and priorities; poor communications; provision not well matched to needs; a lack of coherent planning across all sectors; and inadequate monitoring and evaluation. A second outcome is that all LEAs now have an officer or a senior adviser/inspector with responsibility for INSET planning and, increasingly, institutions are required to nominate a senior teacher or lecturer as the staff development tutor or officer.

43. Increasing numbers of schools now have a staff development policy only some of which sets out individual teachers' INSET needs in relation to the school's plans for the curriculum as a whole. Similarly in FE, INSET now has a higher priority and is becoming better managed at the college level. There have been noticeable improvements in training for FE lecturers as a consequence, but there remains a pressing need for more industrial up-dating and training in tutorial skills.

44. One major benefit of the introduction of the LEATGS has been the devolution of some funds directly to schools, enabling them to identify and to satisfy their own training needs. The designation of the five non-teaching days each year under the new conditions of service for teachers has been another generally effective means of encouraging planned INSET and of reducing the demand for supply cover. However, those changes make heavy demands on the senior staff of schools. The availability of supply cover is a problem in many areas, and even where it is adequate heads, teachers and parents are increasingly worried about the adverse effects upon pupils' education of teacher absences on INSET or for other reasons. Changes in the work of LEA inspectors as a direct consequence of the LEATGS have included their loss of the direct control of INSET budgets and delivery of training which traditionally constituted a major component of their work. This has created some tensions and frustrations within advisory services. Similarly the ITT institutions involved with initial teacher education at first lost much of what they had come to regard as their share in INSET. In some areas they are now beginning to design modular, award-bearing schemes which are proving attractive to LEAs and teachers.

The nature of
quality of INSET

45. The quality of most INSET is at least satisfactory and there are many signs of improving quality. At its best, it is thoroughly planned, effectively delivered and

carefully followed up. Not enough attention is given, however, to the application of the outcomes of training. Much of the provision is insufficiently focused on the needs of teachers. Schools are getting better at identifying their own training needs. Advisory teachers, often funded through ESGs, are having beneficial effects on teaching and learning in science, mathematics, IT and in a range of work in small rural and in inner-city schools. Much INSET at secondary level has arisen from TVEI initiatives and, massively, from the introduction of the GCSE. One particular effect of LEATGS on INSET provision has been to reduce the involvement of teachers in the longer award-bearing courses. Some did not relate to the needs of the schools, LEAs or the service generally. But that is not the main reason for the decline. More influential is the fact that LEAs prefer to mount shorter courses, which they regard as more cost-effective and more closely related to identified needs. In consequence, there are fewer opportunities for teachers to gain higher degrees and it may be that among the courses that suffer some important babies will be lost with the bathwater.

46. The most disappointing sector in this area of development is HE. Most staff development, other than that undertaken by tutors in ITT, is devoted to individual research and acquiring additional qualifications. Little money, time or energy are devoted to meeting institutional or faculty needs, developing individual teaching

skills or raising competence in the applications of IT. In short, INSET in much of HE is hardly ever related to institutional, student or course needs and priorities. It is almost exclusively determined by the tutors and by their perceptions of their own needs. __

Staff Appraisal

47. As part of the management of staff development, a number of LEAs are introducing schemes of teacher appraisal. Most are pilot schemes, at an early stage of development. Where there has been extensive consultation before introducing appraisal, teachers often welcome the process so long as it is mainly seen as a way of identifying their own developmental needs. But few schemes outside the pilots have resolved how to deal with classroom appraisal, and most have not yet faced up to the need to include an element of accountability. In the six pilot authorities in receipt of ESG progress has been made in classroom observation, and the teachers are coming to recognise the value of appraisal in contributing directly to the way in which they do their jobs and to the objectives of the school.

4. ACCOMMODATION AND RESOURCES

Accommodation

General

48. There is excellent, purpose-built, well-equipped and maintained accommodation in all phases of education. However, in secondary education and in FHE there is also much that is old, in a poor state of decoration and repair and ill-suited to its current use.

Primary Schools

49. The accommodation in most primary schools is satisfactory in size, condition and standards of maintenance. Where there are Victorian buildings, or more recent ones with flat roofs, LEAs and schools have great difficulty in maintaining adequate standards of repair and maintenance. In many primary schools, teachers provide attractive, colourful displays of children's work which help to create a welcoming environment, although they are less often used to support pupils' learning effectively.

Secondary Schools

50. In secondary schools there are wide variations in the quality of accommodation which, to some extent, influence the standard and scope of work in classrooms or workshops. There are significant problems, often deriving from poor repair and maintenance, in a little over half the secondary schools which were inspected in 1987-88. A quarter of all of those schools have serious problems. Comparison with the picture revealed by the 1982-1986 survey ["Appraisal"] suggests that

the quality of accommodation in secondary schools has deteriorated still further. Within that somewhat gloomy context a number of specialist departments, such as CDT and business education, have benefited from improvements to their working areas, notably through GCSE or TVEI funding. Schools with split sites or many temporary buildings face particular difficulties, while vandalism, nearly always occurring outside school hours, affects some schools and areas seriously. On the other hand, shortage of space is not a problem; as the numbers of pupils fall, spare accommodation becomes available. While always welcome, such space is not always of the right type to meet schools' needs, especially where new courses are being introduced or where there are major changes in emphasis, such as balanced science courses for all fourth and fifth year pupils.

Further and
Higher Education

51. In FE, some colleges have well-designed and purpose-built accommodation and some premises have benefited from major refurbishment. Many colleges, however, have to use unsuitable annexes and carry out practical work in accommodation which is neither purpose-built nor appropriately equipped. For one reason or another, FE has not always been able to respond adequately to rapid shifts in demand for education and training. For example, it is now short of appropriate specialist accommodation for art and design, computing, mathematics, and English and communication skills. On the other hand there are laboratories for

industrial sciences which are out of date and in need of refurbishment. For example, about a quarter of colleges have traditional engineering workshops which are under-used following the decline in apprenticeships and consequent day release. There is considerable scope, if funds allow, to adapt teaching areas such as those for assignment and project work in a range of specialist areas involving the use of IT.

52. In most HE institutions, specialist accommodation, including laboratories, workshops and studios, is suitable. However, there are some very odd dispositions of inappropriate buildings which are costly and difficult to maintain and which adversely affect the efficiency and economy of the institution as a whole. Inadequate maintenance is widespread, and many polytechnics and college buildings are in need of extensive repairs and refurbishment. In some institutions where the quality of courses is threatened by poor accommodation the enthusiasm and commitment of staff largely overcome the deficiencies, but they cannot be expected to go on doing so if conditions do not improve.

53. Adult education classes often take place in unsatisfactory premises. Very many classes are held in dismal buildings, often inaccessible to the elderly and physically handicapped and frighteningly off-putting to women. There are some very good purpose-built premises and conversions for youth and

community work and the ambience of a number of the youth clubs inspected has been improved by the efforts of youth workers and the young people themselves. However, many youth buildings are drab and uninteresting and in need of capital investment to make them more attractive and functional.

54. By and large, accommodation for ITT is satisfactory or better. The quality of some courses has been enhanced by the recent developments of purpose-built accommodation, including bases for primary work, resource areas and specialist facilities for IT and CDT. There are a few instances of out-of-date or inadequate specialist accommodation, particularly science, and there is a lack of specialist rooms for primary training in institutions that have only recently taken on that responsibility.

Books, Materials and Equipment

Primary Schools

55. In primary schools, the provision of textbooks, especially for language and mathematics, is satisfactory. Nursery schools and classes are well provided for and able to support a broad curriculum. However, the work of under fives in infant classes is often seriously constrained by the limited range of suitable equipment. The supply of books, if not the range, is usually satisfactory and the central library services run by LEAs often contribute significantly to maintaining an adequate supply. Expenditure on primary school libraries varies considerably, from less than

10% of capitation allowances to over 20%; similarly, the ratio of books to pupils ranges from 4:1 to 25:1.

56. Deficiencies in books, materials and equipment continue to stem largely from inadequate identification of needs or from poor management at school and class levels. However, many schools find it increasingly difficult to replace larger, more expensive items of equipment and to support curricular initiatives with the necessary resources. Local authorities often provide additional resources for specific curricular developments and parental contributions comprise an important additional source of income for some schools. In schools inspected, the range of such contributions was from less than 1% of the annual capitation allowance to a figure well in excess of it.

Secondary Schools 57. In the majority of secondary schools the general level of resources is satisfactory, but there are considerable variations; even some generally well provided for schools have specific shortages. The additional funds provided for particular developments, such as the GCSE and TVEI, have been well used and have resulted in considerable gains. Book supplies were judged satisfactory in about three-quarters of the schools inspected, but recent sharp rises in textbook prices are making it difficult for schools to improve their book stocks without supplementary funds. The use of appropriate books in class continues to be uneven and there is often too

great a reliance on printed materials and worksheets.

58. Many school libraries have been neglected for years. Sometimes this neglect has resulted in inadequate or unsuitable stocks; in other cases, the basic provision of books is satisfactory, but pupils simply do not use or borrow them. A small but increasing number of schools demonstrate that libraries can contribute greatly to pupils' learning, as a major support to the curriculum. But in many schools they are not staffed in ways that enable them to fulfil such a function. Nor is it clear that subject teachers in many schools regard the school library as important to their work, even where it is capable of providing such support. A review of the purposes, scope and use of secondary school libraries, based on reality and not rhetoric, is needed before decisions are taken nationally, locally, or at school level about their future funding. In many cases sizeable funds would be needed to make them fully effective.

59. In most secondary schools the quantity of audio-visual aids and other equipment and materials is satisfactory or better. Money provided by the GCSE and TVEI has greatly improved the range and quality of equipment in many schools. However, specific shortages exist. Moreover, even where the range of equipment is adequate, its deployment is variable, with insufficient thought in some schools as to how to ensure that the available

resources are best used to support individual pupils' learning needs. In fewer than half the GCSE music lessons seen were there enough instruments for pupils' use, and practical work in mathematics, CDT and home economics is sometimes inhibited by a lack of equipment. The provision of microcomputers is poor in nearly half the schools inspected this year. Even where it is good, the use of micros is often unsatisfactory. Too few authorities yet have adequate policies for IT and the use of computers across the curriculum. However, more good practice is evident than in previous years, partly because of the work of LEAs' advisory services, including advisory teachers funded by ESGs.

Further Education 60. In FE, national initiatives have led to some up-dating of equipment, especially in IT. Increasing use of IT systems similar to those used in industry has helped to improve links between the work done in colleges and industry. However, many colleges still lack sufficient work-stations and appropriate software. In some specialist areas, particularly in engineering and hotel and catering, there is obsolescent equipment which is in need of replacement.

Higher Education 61. In HE a survey of eight polytechnic libraries found financial allocations to be satisfactory overall, although in one or two polytechnics financial cuts were having adverse effects. Specialist libraries mostly offer effective support, including the capacity for computerised searches. There are

marked improvements in library provision for ITT courses, and most libraries are adequately stocked and used well. Some positive initiatives have encouraged better use of IT in a variety of courses, though much remains to be done to improve this.

62. There is a major need for new capital equipment across HE as a whole, with shortcomings in science, mathematics and computing provision in over 40% of the colleges in the PCFC sector. Equipment over nine years old often becomes uneconomic to maintain and its optimum lifetime, if it is to operate at a reasonable level of effectiveness, is about six years. Currently, however, replacement cycles for major items of capital equipment of 12 years or more are the norm. The PCFC has addressed the problem by instituting a rolling programme of funding intended to lead to eight year cycles.

5. MANAGEMENT AND EVALUATION

Local Education Authority Management and the ERA

63. Local authorities and their institutions are coming to terms with what the ERA will mean for their respective responsibilities in managing, monitoring and evaluating provision. Those authorities with pilot schemes in financial delegation are drawing on them in preparing for the local management of schools (LMS). Although there is some training taking place, especially for heads and governors, much remains to be done in formulating policies for implementing and evaluating the effects of delegation. There is growing, though still uneven, awareness of the rôle of LEAs in measuring performance, and some LEAs are gradually developing their own indicators for use in monitoring work in schools and colleges.

The Work of LEA Inspectors and Advisers

64. Particularly notable is the change in the rôles and functions of local inspectors and advisers that is resulting in some LEAs in radical re-structuring. Many local inspectors have traditionally had a substantial commitment to a variety of administrative and professional matters such as staffing and curriculum development. More recently, they have taken on work related to specific grant, especially LEATGS and ESG funds. The responsibilities now laid on LEAs by the ERA will involve inspectors/advisers in the systematic evaluation of what is provided and the quality of work. It will be necessary for LEAs to know their own strengths, weaknesses and development needs. That will

call for professional advice and judgement based on inspection of one kind or another, with no axes to grind. In smaller LEAs, particularly, there has been a gradual increase in the numbers of inspectors and advisers, but there remain gaps in coverage, notably in FE. The growth in the number of advisory teachers, promoted partly by ESGs, has taken some of the weight of developmental work from the inspectors and advisers. Further clarification of the rôle of advisory teachers is needed, and there is still much to be done to prepare LEA inspectorates and advisory services to respond effectively to the changes taking place.

Sixteen to
Nineteen
Provision

65. Declining numbers in the 16-19 age group make it increasingly difficult to offer a satisfactory range of courses, particularly in small sixth forms. Within schools, contracting numbers sometimes lead to a reduction in what is offered, or to organisational responses such as combining first and second year advanced level classes. A number of LEAs are seeking further to co-ordinate and rationalise what they provide for this age-group and the institutions in which they provide it. Plans to reorganise secondary schools, in order to provide more economically and rationally for 16 to 19 year olds, appear to have been slowed by uncertainty over the effects of recent legislation, especially that relating to grant-maintained schools.

Further and
Higher Education

66. In FE, initiatives such as ESGs, LEATGS, and the work-related FE programme have encouraged more effective matching of courses to the needs of employers, and improvement of the general quality and relevance of provision. In HE, major changes have been associated with the establishment of the PCFC sector, which takes most advanced work out of LEAs' hands. Voluntary colleges and small colleges in the public sector are seeking stronger links with polytechnics and universities. In several instances mergers have been proposed. Elsewhere progress is being made to bring about closer academic association between some institutions involved in teacher training and other higher education institutions. The tendency seems to be for colleges and institutes of education to seek closer association with universities rather than polytechnics.

6. COMMENTARY

67. How the ERA works out in practice depends in part upon how well prepared the education service is to set out on the journey. HMI's findings throughout 1987-88 show that there is much that augurs well for the future. In the majority of schools and colleges standards of teaching and learning are satisfactory or better; initial teacher training and INSET are in much better shape than a few years ago, and the introduction of the GCSE has shown that a combination of central direction and grass-roots professional development and commitment can bring about worthwhile change and improved standards. Also, well-funded Government initiatives such as TVEI, and the ESG for small rural primary schools have substantially improved teaching and learning and the provision made for them.

68. In many ways, then, the education service is well placed to face the future with some confidence. But some old, familiar problems persist. Pupils and students of below average academic attainment continue to get a generally poor deal. Accommodation in many secondary schools and in some FE colleges is in poor shape, shabby in appearance and deteriorating as repair and maintenance are further delayed. The Secretary of State made provision for an increased level of repairs and maintenance in the RSG settlement, and announced a school improvement programme to tackle those problems, but much remains to be done. In FE and HE there are serious shortages of necessary equipment and sensible replacement and updating programmes are urgently needed. In HE the PCFC's proposed rolling programme of funding for capital equipment should bring about marked improvement, particularly if the institutions play their part by managing and planning the use of the funds rationally and effectively. Elsewhere, as our last report on LEA expenditure ["LEA Provision"] revealed, most of the inappropriate provision and shortages of materials and equipment observed in institutions stem from either inadequate management or poor identification of

needs and priorities at the institutional or departmental level, rather than from an overall lack of funds.

69. In addition there are a number of sphinxes along the route whose riddles will need to be solved if the education service is to respond effectively to the many changes it is called upon to make.

70. The first of those centres on that most important component of an effective education service, namely ensuring a sufficient supply of suitably qualified and competent teachers trained and willing to set about doing all that needs to be done. Without that the rest falls. Clearly there are difficulties ahead and many methods and schemes to attract people into teaching will be tried, including more flexible and varied routes for people from different backgrounds. Such schemes will, no doubt, be judged on their merits, but it will be vital to maintain the quality of entrants to teaching even though circumstances may well pull towards a "never mind the quality, feel the width" attitude. Standards of learning are never improved by poor teachers and there are no cheap, high quality routes into teaching.

71. The second is that staffing numbers need to be commensurate with the demands of the national curriculum and the range of management and support that the ERA indicates will be required at the school level. In addition, staffing must allow for the levels of INSET, assessment, reporting and curricular leadership implied by nationally planned developments. For all that to be realistic in many primary schools the non-contact time of the teachers will need to be increased from its present almost non-existent level to somewhere around 10% at least. Achieving that has important implications for the ways in which schools organise teaching and learning, for example, by using improvements in PTRs to increase non-contact time rather than

marginally to reduce class sizes⁶; for the balance between teaching and non-teaching staff in schools; and for the number of primary teachers as a proportion of the total, though not necessarily for the overall number of teachers nationally.

72. Third, in both primary and secondary schools, there are specific shortages of teachers in such subjects as physical science, chemistry, maths, CDT and foreign languages. Some further reorganisation of secondary schools will be required in many areas to ensure the most effective deployment of the available teachers. In primary schools the shortages are similar (excluding foreign languages) though less obvious. While some of those gaps may be filled by recruitment, most at the primary level will have to be met by INSET for existing teachers. That will bring additional pressure to bear on staffing levels in schools. In all of that, the most serious problems apply to the many hundreds of small primary schools which, even though relatively generously provided for, have little scope to do more or other than what they do now.

73. In FE, colleges will need to work within the framework of LEAs' strategic plans to meet the requirements of the ERA and of the work-related FE initiatives. Falling rolls will place a premium on the effective marketing of college courses. Furthermore, links with industry and employers will need to be sustained in such a way as to ensure that vocational courses develop the work-related competencies entailed by the NCVQ criteria.

74. In HE, leaving aside matters particularly affecting ITT, the establishment of the PCFC and institutional incorporation,

⁶ There has been a steady - virtually unbroken - improvement in primary school pupil-teacher ratios over the last 20 years. If more of that improvement had gone into better contact ratios rather than better class sizes, the problem that is described would be significantly less

the most pressing issues centre on the interplay between student numbers, access, standards and funding. In short HE will have to seek more actively than it has in the past to attract and retain students. To be successful in that many institutions and faculties will need to change long-standing ways of organising and carrying out teaching and learning, and what they do in the way of student support including, for example, library and refectory services. In addition, widening and increasing access raises difficult questions about standards, student wastage rates, funding and even the nature of institutions. Those are big and complex matters and they will rarely arise in a discrete form. Nonetheless, immediate issues, such as separating the funding of teaching and research, are components of that wider debate about its future shape and nature in which HE is now involved on both sides of the binary line.

75. There are many changes that schools and FHE will have to make and adapt to in the next few years. In bringing them to fruition those involved need to avoid the tendency towards bewildering and unnecessary complexity that poses great problems for understanding and assimilation. Primary and secondary schools will be seeking to come to terms with a plethora of organisational, curricular and management issues arising from the ERA and, more particularly, with the difficult business of establishing a coherent system of assessment and reporting for the compulsory years of education. To regard such changes entirely as problems would not only be untrue; it would also be counter-productive. But whether the future of education is viewed as problematic or challenging, it is clear that the improvements sought for and intended through the ERA and other initiatives will be achieved only if the teachers are sufficient in number, suitably qualified and experienced, and so committed to the changes that, unsupervised, in thousands of classrooms they will bring their professional skills and competence to bear upon the job in hand.

76. In seeking to ensure that is what happens, teachers' pay, conditions of service and the nature of the changes intended will all have a part to play. But of great importance to most teachers, is that the work they do is seen to be valued and rated highly by society; that its difficulties are understood; and that teachers and education are not used as convenient scapegoats for all society's problems. Currently, too many teachers feel that their profession and its work are misjudged and seriously undervalued. Whatever the rights and wrongs of that view, it is as unsteady a basis on which to build change and improvement as was a situation in which teachers were the first and final arbiters of all matters educational.

SUMMARY OF HMI ACTIVITIES 1987/88

1. During 1987/88 HMI visited, for one purpose or another:

17% of maintained primary schools
 50% of maintained secondary schools
 20% of independent schools
 and almost all further and higher education institutions
 including initial teacher training.

2. The number of inspections intended to lead to published reports included the following 235, by phase:

58 maintained primary schools
 58 maintained secondary schools
 3 independent schools
 53 inspections of further education
 28 inspections of higher education
 8 inspections of initial teacher training
 17 inspections of the youth and community service
 10 inspection of adult and community education

3. During the year 528 inspection reports were published:

135 Primary schools
 124 Secondary schools
 7 Independent schools
 6 Service schools
 19 Special schools
 45 Colleges of further education
 45 Higher education institutions
 19 Teacher training institutions
 10 Youth and community service
 4 Adult education service
 112 Surveys of areas and aspects of education
 2 Reports on the education provided by particular LEAs

4. Between September 1987 and December 1988 among others the following HMI documents were published:

Design and Communications

Education Observed 6: Effective Youth Work

Education Observed 7: Initial teacher training in universities
in England, Northern Ireland and Wales

Aspects of primary education in the Netherlands

Curriculum Matters: Craft, design and technology from 5 to 16

Curriculum Matters: Careers education and guidance from 5 to 16

Curriculum Matters: History from 5 to 16

Curriculum Matters: Classics from 5 to 16

Secondary Schools: An Appraisal by HMI

Education and Training at Sainsbury's (by a seconded HMI looking
at education and training in the retail trade)

NAFE in Practice: 3 Business Studies

NAFE in Practice: 4 Agriculture

NAFE in Practice: 5 Child, Health and Social Care

NAFE in Practice: 6 Computing and Mathematics

NAFE in Practice: 7 Art and Design

NAFE in Practice: 8 Engineering

NAFE in Practice: 9 Hairdressing and Beauty Therapy

NAFE in Practice: 10 Construction

The New Teacher in School

5. Important inspection reports included those on the GCSE (two reports); the use made by LEAs of examination results; and Personal and Social Education in Secondary Schools.

6. In addition, HMI planned and conducted:

71 Short INSET courses attended by approximately 5,000
members of the education service

72 Special conferences attended by approximately 4,100

7. Internationally, 9 major visits were made to observe at first hand and report on relevant developments abroad. The countries involved were Italy, USA, Norway, Sweden, Denmark, Germany, the Netherlands, Belgium and Hungary. (France was visited in earlier years.)

8. HMI maintained their contact with the education service through over 1400 assessorships and other links with outside bodies. These range from substantial contacts with major national bodies such as NAB, PCFC, SCDC, NCC, SEC and SEAC to less frequent contact with other organisations.

e22/2



DEPARTMENT OF EDUCATION AND SCIENCE
ELIZABETH HOUSE YORK ROAD LONDON SE1 7PH
TELEPHONE 01-934 0717

80

FROM THE PERMANENT SECRETARY
SIR DAVID HANCOCK KCB

Andrew Turnbull Esq
10 Downing Street
London SW1

21 February 1989

Dear Andrew,

MEETING WITH UNIVERSITY VICE CHANCELLORS

Following our telephone conversation I and my private secretary have spoken to all the intended participants in the discussion with the Prime Minister at 3 pm on Monday 13 March. The list is attached as an annex to this letter and I am now able to confirm that they will all be there.

2. I thought it prudent to confirm with both Lord Flowers and Sir Patrick Neill that Sir Mark Richmond - in his capacity as the current Chairman of the CVCP - should be regarded as the principal spokesman for the group. Neither raised the slightest objection. Lord Flowers told me that he and Sir Patrick Neill were drafting a piece of paper which the group might send to the Prime Minister in advance of the meeting. He will pass the draft to Sir Mark Richmond who will then clear it with the other Vice Chancellors assuming that he is satisfied with it himself.

3. I take it that the next step will be for you to write to the participants to confirm the invitation.

4. I am copying this letter to Tom Jeffery in my Secretary of State's office.

Yours,

David.

LIST OF PARTICIPANTS AT THE DISCUSSION WITH THE PRIME MINISTER AT
3 PM ON MONDAY 13 MARCH 1989

DES AND UFC

Secretary of State for Education and Science
Lord Chilver
Sir Peter Swinnerton-Dyer

Vice Chancellors

Sir Mark Richmond - Chairman of CVCP and Manchester
Lord Flowers - London
Sir Patrick Neill - Oxford
Sir John Kingman - Bristol
Professor Graeme Davies - Liverpool
Dr Ewan Page - Reading

PRIME MINISTER

MEETING WITH UNIVERSITY VICE CHANCELLORS: LORD CALLAGHAN

A meeting has now been arranged with Sir Mark Richmond, Lord Flowers and others for 13 March to talk about the problems of the universities. They are putting together a paper as a basis for the discussion.

This leaves the problem of Lord Callaghan who is still angry about your refusal to go along with his original plan. (At one stage he sought to involve Lord Whitelaw in it, but I have confirmed with the latter that he does not wish to get involved.)

Do you wish to see Lord Callaghan on his own in his capacity as an ex-Prime Minister with an interest in universities through his Presidency of University College Swansea?

Or prefer to wait and see if he writes?

S.H.H.

If Lord Callaghan writes
do see me - I would
will see him on his own
pub

pp. AT

21 February, 1989.

Note: Spoke to FERB. on basis of how matter was left between him and Lord Callaghan, he recommended letting "sleeping Lord C lie". It would not be a pleasant meeting on either side. Argued no action unless Lord C writes.

AT
22/2

PRIME MINISTER

MEETING WITH UNIVERSITY VICE CHANCELLORS

You agreed to see a group of senior figures from the University world to talk about the problems of Universities. I have sought advice from Mr. Baker which is in the attached letter.

I have been back to DES to clarify three points:

- i) Why omit Sir Patrick Neill? DES say they proposed omitting him because he would winge in the first 30 seconds and do the Universities' cause no good at all. When I explained that one of the objects of the meeting was to trump Lord Callaghan's initiative they accepted that we should include the two names he had mentioned.
- ii) They think it would be difficult to invite Sir Peter Swinnerton-Dyer without Lord Chilver but saw no problem in inviting them both.
- iii) If all these names are invited there would be 10 people at the meeting. This seems to me about the maximum but not too many. But if you wanted to cut it down DES's order of priority for attendance would be:

- i) Richmond
- ii) Page
- iii) Davies
- iv) Kingman

There is no lunch spot available in the near future but a meeting could be arranged for 1500 hours on Monday, 13 March.

Content?

AF

Yes no

A. TURNBULL

15 FEBRUARY 1989



ELIZABETH HOUSE
YORK ROAD
LONDON SE1 7PH
01-934 9000

CONFIDENTIAL

Andrew Turnbull Esq
10 Downing Street
London SW1A 2AA

14 February 1989

Dear Andrew

MEETING BETWEEN THE PRIME MINISTER AND UNIVERSITY VICE-CHANCELLORS

Your letter of 13 February asked for advice from my Secretary of State on senior figures from the University world who might be invited to a meeting with the Prime Minister.

Mr Baker agrees that it would be right to invite Lord Flowers, particularly because the University of London forms so large a part of the university system, but would advise against inviting Sir Patrick Neill. My Secretary of State also suggests that it would be preferable to omit Sir Peter Swinnerton-Dyer. As Chief Executive of the new Universities Funding Council, he could hardly be invited without his Chairman, Lord Chilver. Including them in a small group would not leave room for a proper cross section of Vice-Chancellors and could shift the discussion away from the key points which the latter may want to put to the Prime Minister. Mr Baker therefore suggests, in addition to Lord Flowers: Professor Sir Mark Richmond (Manchester, Chairman of the Committee of Vice-Chancellors and Principals); Sir John Kingman¹ (Bristol); Dr Euan Page² (Reading); and Professor Graeme Davies (Liverpool)?

I am copying this letter to Sir Robin Butler.

Yours are,

Tom Jeffery

TOM JEFFERY
(Private Secretary to the
Secretary of State)

CONFIDENTIAL



ELIZABETH HOUSE
YORK ROAD
LONDON SE1 7PH
01-934 9000

Mr A Turnbull
Principal Private Secretary
10 Downing Street
LONDON

13 February 1989

Dear Mr Turnbull

My Secretary of State has asked his officials to send today to all local education authorities in England a letter which reminds them of their duties and responsibilities in connection with ballots of parents on grant-maintained status under the Education Reform Act 1988. It sets out his own powers to hear and determine complaints against LEAs where parents and others believe there has been malpractice.

I attach a copy of the letter, together with a background note and line to take for the Prime Minister. I am sending a copy of this letter and its attachments to Alex Allan (Treasury), Roger Bright (Environment), David Crawley (Scottish Office), Steven Williams (Welsh Office) and Mike Maxwell (Northern Ireland).

Yours Sincerely

P V D Swift

P V D SWIFT
Private Secretary

GRANT-MAINTAINED SCHOOLS : ACTION AGAINST INTIMIDATION

Line to take: Parliament has given parents the right to vote on whether their child's school should leave the control of the local education authority. We will not allow anyone to hinder or deter parents from exercising that right. I expect local authorities to behave responsibly and fairly: allegations of unfair play must be taken seriously. We shall listen to parents' complaints and if there is substance to them we shall act.

Background Note

DES Ministers have become increasingly concerned about allegations from parents, governors and staff that LEAs have been abusing their position to put unfair pressure on voters and to run expensive misinformation campaigns where a school is considering whether to become grant-maintained. In response, officials have today written to all Chief Education Officers emphasising LEAs' responsibilities for securing that ballots are conducted in a fair and unthreatening way. A copy of the letter is attached. The letter was heralded by a PQ on Friday, and reinforced by the Secretary of State's speech to the Young Conservatives on Sunday. There has already been substantial media coverage.

Jack Straw MP has called upon the Secretary of State to substantiate the allegations referred to in the letter. A request for a statement has been resisted. Care has been taken to emphasise that the instances referred to are allegations which have come to our attention; at no time have Ministers expressed a view on the validity of the allegations.



10 DOWNING STREET

LONDON SW1A 2AA

From the Principal Private Secretary

13 February 1989

Dear Tom,

LORD CALLAGHAN AND THE UNIVERSITIES

Lord Callaghan recently approached Sir Robin Butler to say that he wished to come and see the Prime Minister, together with Sir Patrick Neill and Lord Flowers, to talk about the problems felt by the Universities. The Prime Minister has said that she would be prepared to see Sir Patrick and Lord Flowers (whom she knows well and is one of her constituents) and indeed others, but she thinks it would be preferable to see them directly rather than through the intermediation of Lord Callaghan which would be bound to introduce a political element.

Sir Robin relayed this to Lord Callaghan. He protested that this amounted to a refusal to see him as a former Prime Minister, and that he had intended to involve one further person, who was in fact a Conservative. He said he might nonetheless write to the Prime Minister asking her to see him.

BF | The Prime Minister would welcome early advice from the Secretary of State on senior figures from the University world who might be invited to such a meeting. The Prime Minister has in mind seeing a group of four or five which should include someone from the provincial universities. She would want to include Sir Peter Swinnerton-Dyer. The format could be either a lunch here or a meeting, depending on the constraints of the diary. The Prime Minister would like the arrangements to be set up quickly so that they can provide the basis for replying to Lord Callaghan's letter if and when it arrives.

I am copying this letter to Sir Robin Butler.

Yours sincerely
Andrew Turnbull

(ANDREW TURNBULL)

Tom Jeffery, Esq.,
Department of Education and Science.

CONFIDENTIAL

MEM

Prime Minister
To note: I will put
in hand X
AT 10/2

Ref. AO89/412

MR TURNBULL

Lord Callaghan and the Universities

I spoke to Lord Callaghan on the lines agreed. I said that the Prime Minister already had in hand arrangements to ask, through the Secretary of State for Education, some leading university figures to come for a talk about problems felt by the universities. She would be happy to include Sir Patrick Neill and Lord Flowers (whom she knows well and, is one of her constituents) in that, but this would be a preferable way from her point of view of handling the matter rather than the arrangement proposed by Lord Callaghan which was bound to introduce a political element.

2. Lord Callaghan reacted angrily to this and said that it amounted to a refusal to see him as a former Prime Minister. I said that I did not think that the Prime Minister intended it this way: it was simply that she was already making an arrangement to meet leading university figures and it would be convenient if she could see Sir Patrick Neill and Lord Flowers as part of that.

3. Lord Callaghan said that he had intended to involve one further person, who was in fact a Conservative. He said, despite my message, that he might nevertheless write to the Prime Minister asking her to see him: and on that note we ended the conversation.

Yes
X/

4. I take it that you will now ask the Secretary of State for Education to carry forward fairly rapidly the suggested arrangements for the Prime Minister to have the sort of meeting which she has proposed: if this is in hand it will provide a basis for replying to Lord Callaghan's letter if and when it arrives.

10 February 1989

TAWANU

MP ROBIN BUTLER

ce P.O.



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From The Secretary of State for Wales

Oddi wrth Ysgrifennydd Gwladol Cymru

CT/3079/89

NBFM
P/c6
9/2

9 February 1989

Das David,

SELF GOVERNING SCHOOLS ETC (SCOTLAND) BILL

(at P/c6)

Thank you for copying to me your letter of 3 February to Paul Gray.

Your third paragraph can be read as saying that provisions allowing further education colleges in England and Wales to incorporate themselves under the Companies Acts while remaining in the local authority sector have long been included in education law. The position is that the option of becoming a limited company, by agreement between the college and the maintaining LEA, has been an option under general local government law, but there have been no specific provisions in the Education Acts. Section 156(5) of the Education Reform Act 1988 provides that where it is proposed to form a company to conduct a maintained institution of further or higher education, the memorandum and articles of association shall be subject to the Secretary of State's approval, but it is not necessary to include any provisions enabling the formation of the company in the new legislation.

Copies of this letter to the private secretaries of E(EP) members and Trevor Woolley.

James Stephen

S R WILLIAMS

David Crawley Esq
Private Secretary to the Secretary of State for Scotland
Scottish Office
Whitehall
LONDON SW1A 2AU

filed on Education PT 20

General Policy



file DTS

be: B9

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

6 February 1989

Dear David,

SELF-GOVERNING SCHOOLS ETC (SCOTLAND) BILL

Thank you for your letter of 3 February which the Prime Minister has seen. Subject to the views of colleagues, she is content with your Secretary of State's proposals.

I am copying this letter to the Private Secretaries to members of E(EP) and Trevor Woolley (Cabinet Office).

Yours,

P-G

PAUL GRAY

David Crawley, Esq.
Scottish Office

DTS



SCOTTISH OFFICE
WHITEHALL, LONDON SW1A 2AU

copy

Paul Gray Esq
10 Downing Street
LONDON
SW1A 2AA

Prime Minister
These provisions seem to be of a minor,
tidying-up nature. Contact with them,
subject to the views of colleagues?

3 February 1989

REC 6

3/2

mt

Dear Paul

SELF-GOVERNING SCHOOLS ETC (SCOTLAND) BILL

E(EP) agreed last July to the main measures to be included in this session's Education (Scotland) Bill (now to be entitled the Self-Governing Schools etc (Scotland) Bill). There still remain a few outstanding policy issues for which my Secretary of State seeks clearance. The most substantial of these cover teacher appraisal and further education colleges.

The Secretary of State proposes to include in the Bill provisions enabling him to prescribe by regulations the appraisal of the performance of teachers employed in all Scottish schools and further education establishments, other than in the independent sector. A single clause is envisaged similar to section 49 of the Education (No 2) Act 1986 which provides a comparable power in respect of appraisal of teachers in England and Wales. The Secretary of State hopes to see appraisal introduced on a voluntary basis by education authorities following staff development pilot studies which are presently being conducted. However largely because of trade union hostility to the concept, these studies are not likely to produce much of value on the conduct of appraisal schemes. The Secretary of State judges it necessary therefore to take enabling powers, which will allow him to make regulations to ensure that this key element in improving teaching and learning in Scottish schools is introduced.

The Secretary of State wishes also to include provisions allowing Further Education colleges to incorporate themselves under the Companies Act while remaining within the local authority sector as assisted colleges. This option has long been available in England and Wales. We shall also be giving further education college councils greatly increased delegated powers, a new membership at least half of whom will be employers, and the power to undertake commercial activities so they will have both the freedom and the incentive to innovate and respond to labour market needs.

Further minor measures due for inclusion in the Bill are listed at Annex A.

Copies of this minute go to the Private Secretaries of members of E(EP), and Trevor Woolley. I would be grateful for any comments by close of play on Monday 6 February.

*Yours sincerely,
Ian Wright.*

pp **DAVID CRAWLEY**
Private Secretary

1. General Teaching Council

The Teaching Council (Scotland) Act is to be amended to entitle persons to be registered with General Teaching Council if they fulfil such requirements as the Secretary of State may, after consultation with the GTC, prescribe by regulations. The GTC is soon to be required by EC Directive to register nationals of other member states who are recognised as teachers, provided that they have a 3-year Higher Education diploma. It will also be necessary to treat teachers from other parts of the United Kingdom in a similar way.

2. Special Educational Needs - Placing Requests

a. The Education (Scotland) Act 1980 is to be amended to clarify that placing requests may be made for special schools located anywhere in the UK. It has been common in the past for Scottish children with specific impairments such as autism or epilepsy to attend schools in England specialising in these particular conditions. A recent court case has cast doubt on the vires of this practice and particularly that of placing requests from Scottish parents in favour of such schools. It is proposed therefore to reinstate beyond doubt the previous interpretation.

b. The Education (Scotland) Act 1980 enables an education authority not to accept a placing request for an independent special school where it can make, at less cost, adequate provision for the needs of the child in a school under their management. This provision has on occasion been applied too stringently, resulting in inappropriate school placement. It is proposed therefore to substitute a condition that the duty to accept such a placing request may be set aside only if it is reasonable to do so having regard to the suitability, as well as the cost, of the education the authority can provide at a school under its own management.

3. Junior College Provisions

Provision in the Education (Scotland) 1980 Act relating to Junior Colleges (compulsory further education) are to be repealed. These provisions, originally enacted in the 1940s, were never commenced and are now anachronistic.

Scottish Office
February 1989



me how

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

22 January 1989

Dear Tom,

HUDDERSFIELD POLYTECHNIC

The Prime Minister was grateful for your Secretary of State's minute of 9 January, and the attached article from the Telegraph which she has seen and noted.

*Yours,
Paul*

Paul Gray

Tom Jeffery, Esq.,
Department of Education and Science.

Paul



Prime Minister 4

REC
19/1

PRIME MINISTER

HUDDERSFIELD POLYTECHNIC

I know you are keenly interested in the work of Ken Durrands, the Rector of Huddersfield Polytechnic. I thought you might like to see the attached article from today's Telegraph. I think it shows how very welcome our policies are and what a good job some of our most innovative polytechnics are doing.

KB..

ms

K B
Department of Education and Science

19 January 1989

Liberation with a charter for change

FREEDOM DAY is approaching for Huddersfield Polytechnic. That, within the institution at least, is the prevailing sentiment as it edges closer to April 1, when all 50 polytechnics in England and Wales secure their independence from local authorities to run their affairs as free-standing corporations.

Some polytechnics may be preparing for the divorce with sorrow. But Huddersfield's rector, Prof Kenneth Durrands, has lobbied for autonomy almost since he took over the polytechnic at its inception in 1970.

After nearly two decades of conflict with Kirklees Council, he is less than reticent on matters such as local authority inefficiency or the unsuitability of "capricious and vicious" local politicians to exercise power over places of higher education.

"They are capricious when they don't have one-party control," he explains, "because the votes on whether you can have approval for something keep switching as the issue goes through various committees."

"And they are vicious when they do have one-party control, because then they've got you where they want you."

The nadir of the polytechnic's relationship with Kirklees was during what Durrands terms "the Five Years' War" between 1978 and 1983, when Left-wing councillors cut the institution's budget by a fifth and attempted to force out senior management.

The Government's Education Reform Act says that all poly-

Polytechnics are about to gain their independence from local councils.

Paul Marston looks at the opportunities that this will bring

technics, and the larger colleges of higher education, will from April draw most of their governors from the business world.

At Huddersfield — a medium-size polytechnic with 7,200 full- and part-time students — the change means the accession of two executives of engineering firms, a textiles chairman, an oil company director, a solicitor, a consultant psychiatrist and a member of an accountancy partnership.

Local authority representation, which used to constitute an effective majority, drops to one.

"What I am most looking forward to under the new governors is the introduction of boardroom practice," says Durrands, with the nostalgic air of a former director of Vickers.

"At last we will be able to take decisions ourselves and respond to the needs of business immediately. In the past, we have been unable to respond to industrial time scales, which is not healthy for an institution trying to produce people to design, make and sell."

Financially, the polytechnic

believes it can prosper under both self-management and the new Polytechnics and Colleges Funding Council, whose decisions over sharing out public funds to different institutions also take effect from April.

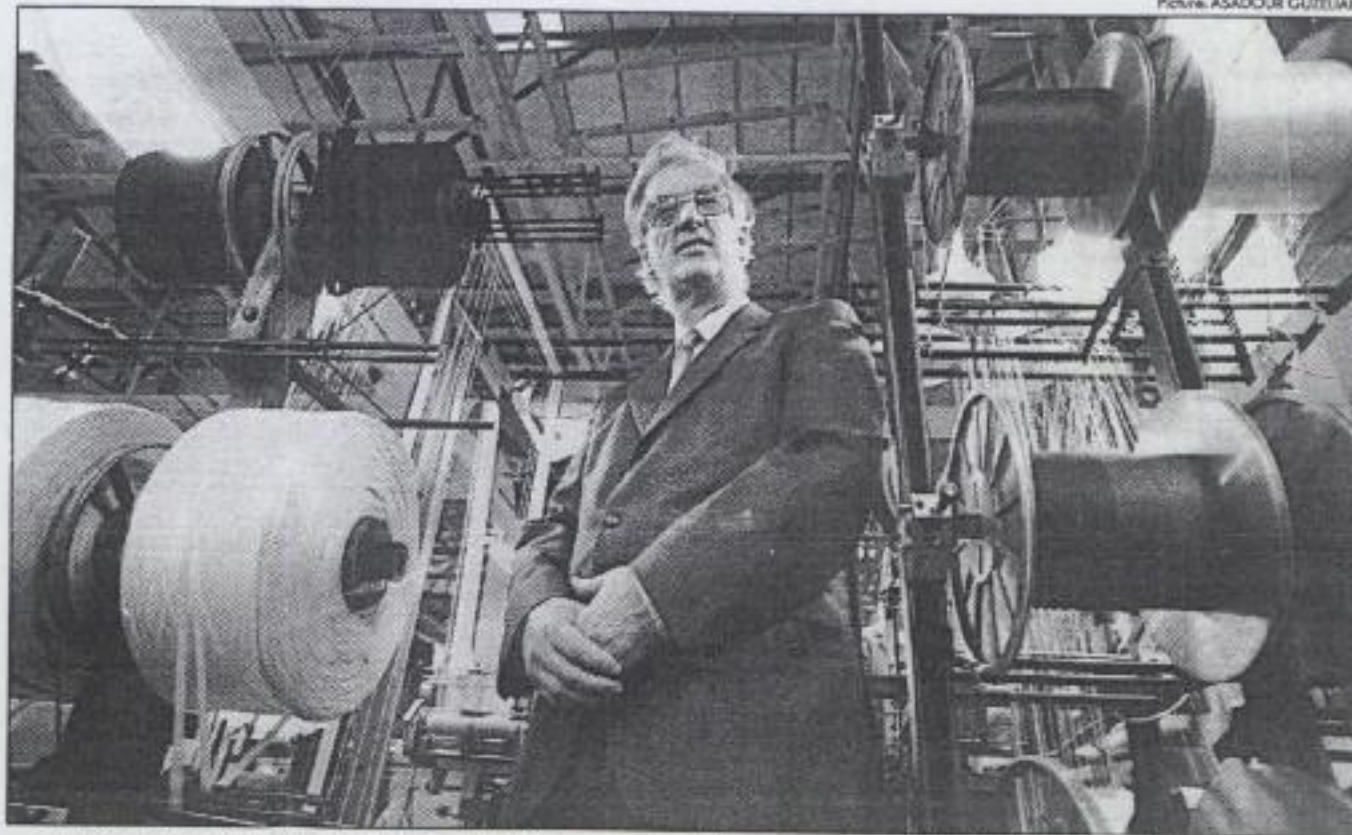
While Kirklees was relatively generous in "topping up" Huddersfield's central grant, it levied the second highest charges in Britain for its services to the polytechnic. Maintenance had to be done by the authority's direct labour organisation, whose rates, the polytechnic estimates, were at least twice those of private contractors.

Though most of the polytechnic's £27 million income last year came from central funds, £4 million derived from course fees fixed by the local authority. The polytechnic has no doubt it could enhance revenue by raising fees for some courses, particularly short, high-demand business programmes.

Tom Gaskell, pro-rector in charge of finance, seeks a 25 per cent expansion in the first five years of independence. "We might increase income by raising recruitment," he says, "but the main way forward is likely to be through extending direct links with industry."

"We have £13 million worth of high technology equipment — far more than many small and middle-sized companies. So we can do research and development for them, help build and test products, or carry out consultancy work."

Huddersfield already earns



Tom Gaskell in Huddersfield Polytechnic textile department with machinery that will be hired out for use by local industry

£3 million a year from such activities, with particular strengths in engineering, electronics, and — reflecting local history — textiles.

Now recovering from the recession of a few years ago, the textile industry has spawned a new generation of small manufacturers for which the polytechnic wants to become the centre for training. All employees could learn techniques such as design, marketing, product specification and languages.

Huddersfield's response to the Government call for polytechnics to concentrate on courses offering "bankable skills" has not excluded its arts

department. From this autumn, the old-style BA Humanities course, which attracted 400 students a year, will be replaced by the more vocational Communications Arts, and a pioneering Historical and Political Studies degree, including two-months "work experience".

Placements have been arranged for students in stately homes, museums and record offices, and working alongside MPs and trade union officials. "Managerial" attachments with companies are also planned.

Dr Bill Roberts, the course leader, believes that such innovation can develop the "per-

sonal, transferable skills" in arts graduates which employers want. Without change, he reckons, arts education in polytechnics faces oblivion.

A leading argument for granting polytechnics independence has been that it will increase awareness of their vocational role and stifle their old image as "second-class universities".

Patrick Coldstream, director of the Council for Industry and Higher Education, says polytechnics do not realise how their work is "tremendously misunderstood" by the media and even among ministers and leading businessmen.

Dr Paul Arthur, Huddersfield's assistant rector, thinks the issue is more subtle: "Our image doesn't matter much to potential customers because their concern is whether we can deliver what they want at the right time and at the right price."

"Schools now have a good idea of what we're about because we've built up better relationships with them. Where it may have some effect is with parents educated before we came along, who might discourage children from applying. Corporate status should help us to break down that prejudice."

Picture: ASADOUR GUTLIAN



apu

DEPARTMENT OF EDUCATION AND SCIENCE

ELIZABETH HOUSE YORK ROAD LONDON SE1 7PH

TELEPHONE 01-934 9000

FROM THE PARLIAMENTARY UNDER-SECRETARY OF STATE

13 January 1989

Dear Colleague,

RIS

CHARGES FOR SCHOOL ACTIVITIES

I attach for your information a copy of the Department's Circular on this subject which was published on 12 January. The Circular explains the charging provisions of the Education Reform Act which will take effect from 1 April 1989.

As the introduction to the Circular explains, the changes which the Government introduced were necessary because of successful challenges in the Courts to existing charging practices.

There has been extensive consultation on the contents of the Circular with the local authorities and other interested bodies. One of the reasons for its length is that we have had requests for plenty of practical advice on the working of the new system. Section X, for example, emphasizes that the schools can invite voluntary contributions towards the cost of school activities, even where these take place in school time and cannot be subject to a compulsory charge.

We believe that the legislation provides a sound framework for the existing wide range of school activities to continue, provided they are valued by parents who have in the past been prepared to pay. The text of the Circular has been agreed with representatives of the Local Education Authority interests and this indicates that it will prove to be a workable document. We shall, of course, be keeping a close watch on the outcome of the new arrangements in practice.

Yours truly
John Butcher

JOHN BUTCHER



Department of Education and Science

Elizabeth House
York Road
London SE1 7PH

Circular No 2/89
12 January 1989

To: Local Education Authorities

All county, voluntary and
maintained special schools

Other bodies

EDUCATION REFORM ACT 1988

CHARGES FOR SCHOOL ACTIVITIES

I. INTRODUCTION

1. Sections 106-111 and 117-118 of the Education Reform Act 1988 set out the law on charging in all LEA-maintained and grant-maintained schools. These provisions will replace the provisions of section 61 of the Education Act 1944 from 1 April 1989. The purpose of this Circular is to explain and provide guidance on the new provisions.
2. The new provisions were introduced in the Education Reform Act because of widespread uncertainty about the interpretation of the provisions of the 1944 Act. Section 61(1) of that Act states that "No fees shall be charged in respect of admission to any school maintained by a local education authority, or to any county college, or in respect of the education provided in any such school or college".
3. Whilst a definitive interpretation of this section is a matter for the Courts and its application is dependent on the circumstances of each individual case, the Secretary of State and the local authorities noted a number of legal judgements in recent years which found against charges which were being made in schools for certain activities. The implication of these judgements was that section 61 could preclude charges being made for all activities offered to pupils by schools during the school day, whether on or off the premises, since these activities were all part of the "education provided" in the school.
4. In March 1988 the Secretary of State advised local authorities that this was his understanding of section 61 of the 1944 Act. He was also advised that the Courts would be likely to interpret the term "education provided" as including any activities organised by the school outside the school day, and not recognisably distinct from the school curriculum. In such cases, it appeared that any transport required — other than transport from home to school — would also have to be provided free of charge, as would any board and lodging where the education provided on a residential course could not otherwise be provided for the pupil.

5. It was clear that the law required clarification, but consultation with the Local Authority Associations and others produced no immediate consensus of opinion about the activities during school hours for which it would be appropriate to make a charge, with the exception of individual tuition in the playing of a musical instrument. The provisions in the Education Reform Act recognise the principle of free school education and also reflect the Government's view that LEAs should be able to charge parents for optional activities which are provided out of school hours. The advice given in this Circular explaining the provisions of the Act has been the subject of detailed discussions with the Local Authority Associations.

6. The objectives of the charging provisions in the 1988 Act are

- to maintain the right to free school education.
- to establish that activities offered wholly or mainly during normal teaching time should be available to all pupils regardless of their parents' ability or willingness to help meet the cost.
- to emphasise that there is no statutory requirement to charge for any form of education or related activity, but to give LEAs and schools the discretion to charge for optional activities provided wholly or mainly out of school hours.
- to confirm the right of LEAs and schools to invite voluntary contributions for the benefit of the school, or in support of any activity organised by the school, whether during or outside school hours.

Contents of this Circular

7. The rest of this Circular explains the provisions of the legislation and how they will operate, in the following sections:—

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Definitions

8. The charging provisions of the Education Reform Act relate to all maintained schools, whether LEA or grant-maintained. Except where a reference is made to any particular category of school, any reference to a school or maintained school should be read as applying to all maintained schools, including sixth form colleges, special schools and nursery schools. City Technology Colleges and City Colleges for the Technology of the Arts are independent schools and, as such, are not covered by the charging provisions of the Act, but paragraph 64 explains the Government's intention that similar requirements should be applied to them.

9. References in the charging provisions of the Act and in this Circular to the provision of education relate to school education only, unless specified otherwise.

10. Section 118(4) of the Act makes clear that these provisions relate only to charges which may be made by an LEA or a school governing body and which may be paid by a pupil or a pupil's parents. They should not be read as relating to charges for any educational activity which may otherwise be levied or paid by other persons (but see also paragraph 18).

II. SCHOOL ADMISSIONS

11. Section 106(1) prohibits charging for admission to any maintained school. Circular 11/88, concerning the admission of pupils to county and voluntary schools, emphasises that whilst LEAs and governors may apply any reasonable criteria for deciding which pupils to admit to an over-subscribed school, such criteria must be subject to the requirements of the law. It would not be acceptable to operate criteria which take account of a parent's willingness or ability to make a contribution.

III. EDUCATION DURING SCHOOL HOURS

12. School hours are those hours when the school is actually in session, and do not include the break in the middle of the school day. The Secretary of State will make regulations under section 118(5) requiring LEAs, governing bodies or headteachers to make available information on school hours.

13. The basic principle underlying the charging provisions of the Act is that education provided by any maintained school for its registered pupils should be free of charge if it takes place wholly or mainly during school hours. If the number of places available for a particular activity is limited, the school must decide which pupils should be given the opportunity to participate, without reference to parents' willingness or ability to make a voluntary contribution towards the cost.

14. The exceptions to the principle of free education which the law allows under section 106(3) are:—

- (a) that a charge may be made in respect of individual tuition in playing any musical instrument, even if such tuition takes place during school hours, except where it is provided to fulfil the requirements for a syllabus for a prescribed public examination or the requirements of the National Curriculum, when it must be provided free. If a charge is to be made, parental agreement must be obtained before the tuition is provided.
- (b) that a grant-maintained school may charge for adult or other non-school education provided on the premises during school hours, where the governors are acting as agents of the LEA under the provisions of section 57(5) of the Education Reform Act.

Incidentals to the provision of education

15. Under section 106 neither the pupil nor his or her parents may be required to pay for, or to supply, any materials, books, instruments or other equipment for use in connection with education provided during school hours. Parents may be invited to provide their children voluntarily with particular items, in order to release resources from the school budget for other purposes, but no child should be at a disadvantage because of a parent's unwillingness or inability to contribute in this way. Equipment is defined in section 118(7)(a) as excluding clothing: LEAs will continue to have discretionary powers under section 5 of the Education (Miscellaneous Provisions) Act 1948, to provide clothing where a pupil comes to school inadequately or unsuitably dressed or where parents have not provided items such as cookery aprons or football boots. Parents can still expect the LEA or the governing body to provide essential protective clothing such as safety goggles.

16. Under section 106(7) and (8) any transport provided in school hours by the LEA or the school to carry pupils between parts of the school's premises, or between the school and any other place where education is to be provided by the LEA or the school, must be provided free of charge. However, if a pupil makes use of transport not provided by the LEA or school to travel direct from home to an activity sanctioned, though not provided, by the LEA or the school, then parents may be asked to meet the cost of such travel. An example of this would be travel direct from home to work experience and vice versa, though in such a case it would still be open to the LEA or school to consider a subsidy where parents have difficulty in meeting such a cost.

Charging in kind

17. As indicated in paragraph 15, schools must be prepared to provide or pay for any ingredients, materials, equipment etc needed for practical subjects such as home economics and CDT. Parents who are willing to contribute in cash or in kind can however be encouraged to do so on a voluntary basis. The school may charge for, or require the supply of, ingredients and materials if parents have indicated in advance a wish to own the finished product.

Activities arranged during school hours by a third party

18. There may be occasions when an organisation other than the LEA or governing body arranges an activity to take place during school hours, and parents ask the school to grant their children leave of absence to join the activity. Under the terms of section 118(4) the third party would be able to levy charges direct on the parents in return for the services provided. The LEA and school governing body would not take part in the transaction and it would be for parents, and any staff members similarly released for the activity, to satisfy themselves about the adequacy of the arrangements made by the third party to secure the safety and welfare of the children. The governing body and headteacher would need to consider whether the release of the pupils could be justified, given the need to meet the statutory requirements of the school curriculum in respect both of those pupils and of the pupils remaining at school. They would also need to bear in mind the requirements of the Education (Schools and Further Education) Regulations that a pupil must not be granted more than 2 weeks' leave of absence in any year, save in exceptional circumstances.

IV. EDUCATION OUTSIDE SCHOOL HOURS

Free education

19. Under section 106(4), no charges may be made for education, or associated incidentals, provided wholly or mainly outside school hours for registered pupils where the education is provided:

- (a) to fulfil any requirements specified in the syllabus for a prescribed public examination (see paragraph 43); or
- (b) specifically to fulfil statutory duties relating to the National Curriculum, imposed by section 10(2) of the 1988 Act; or
- (c) specifically to fulfil statutory duties relating to religious education imposed by section 10(1)(b).

In these circumstances the only charges which may be made relate to the cost of board and lodging on residential visits (see paragraph 33).

20. The provisions in (a) and (b) above also override the provision enabling charges to be made for individual instrumental music tuition (paragraph 14(a)) and require that such tuition be provided free in the circumstances defined, regardless of whether it takes place during or outside school hours.

Optional extras

21. Charges may be made for education provided for registered pupils wholly or mainly outside school hours if the provision does not come within any of the categories outlined in paragraph 19(a)-(c) above. Such education is defined in section 109 as an "optional extra" and charging is at the discretion of the body which would otherwise meet the cost of the provision. An activity which takes place during school hours cannot, by definition, be an optional extra, except where it involves individual tuition in the playing of a musical instrument and is not covered by paragraph 19(a) or (b).

22. Participation in any optional extra activity will be on the basis of parental choice and a willingness to meet such charges as are made. The agreement of parents is therefore a necessary prerequisite for the provision of an optional extra for which charges are to be made.

23. Any charge made in respect of individual pupils may not exceed the actual cost of providing the optional extra activity, divided equally by the number of pupils willing to participate. It may not therefore include an element of subsidy for any other pupils wishing to participate in the activity whose parents are unwilling or unable to pay the full charge. Nor, in cases where a small proportion of the activity takes place during school hours (see section V), may it include the cost of alternative provision for those pupils who do not wish to participate. Any subsidies of this kind must come from LEA or school funds, or from voluntary fund-raising. The cost can include an appropriate element for:

- (a) a pupil's travel costs;
- (b) a pupil's board and lodging costs;
- (c) materials, books, instruments and other equipment;
- (d) non-teaching staff costs;
- (e) entrance fees to museums, castles, theatres etc;
- (f) insurance costs.

24. Any charge may also take account of the costs of engaging teaching staff specifically for the purpose of providing the activity and supplying such staff with travel, board and lodging. If any of the teaching staff are already employed by the LEA or the governors of the school, their costs may not be included in the costs passed on to pupils, unless they are:

- (a) employed to provide individual tuition in the playing of a musical instrument; or
- (b) engaged on a separate contract for services to provide the optional extra.

For the purpose specified in (b), a contract for services can be a simple document or letter, written on behalf of the governing body or the LEA, inviting a teacher to provide certain services for a specific activity taking place at a specified time, in return for payment of expenses and, where appropriate, a fee. The teacher should be asked to signify agreement by signing and returning a copy of the letter.

25. There is no requirement to charge for optional extras. The body funding the activity is free to determine whether any charge should be made for it and, if so, how much should be charged and to whom, subject to the overriding factor that the charge must not exceed the actual cost. Where the governing body of an LEA maintained school has funded an activity from within its delegated budget under an approved scheme of local management, or from other funds at its disposal, it alone will decide whether the cost should be passed on in full or in part to parents. Where the LEA is funding the activity and has determined to recover the cost, there will be a charge to parents, unless the governing body decides in accordance with section 109(10) to use its own funds to subsidise the activity. Section IX of this Circular explains that every LEA and governing body must have a stated policy on charging and remission, so that parents are clear on the approach to be adopted.

V. EDUCATION PARTLY DURING SCHOOL HOURS

26. Where an activity takes place partly during and partly outside school hours, the Act prescribes a basis for determining whether it is deemed to take place either in or out of school hours. In the former case, no charge may be levied in respect of the activity unless it involves individual tuition in the playing of a musical instrument (paragraph 39) and any fund-raising must be on the basis of voluntary contributions. In the latter case, a charge may be made unless the activity is covered by paragraph 19 above. The calculation to be applied in determining the status of an activity for charging purposes depends on whether it is a day-time activity or residential.

Non-residential activities

27. Section 107 provides that a non-residential activity is deemed to take place during school hours if 50 per cent or more of the period spent on the activity occurs during school hours. Time spent on travel counts for the purposes of this calculation only if the travel itself occurs during school hours, as explained in section 107(2). School hours do not include the break in the middle of the school day. As an example, a long-distance excursion might involve some hours of travel before and after the school day, but the time spent at the destination could fall mainly within normal school hours. In this case the excursion would be classified for the purposes of the charging legislation as an activity taking place wholly or mainly in school time.

28. Where less than 50 per cent of the time spent on a non-residential activity falls during school hours, the activity is deemed to have taken place outside school hours. An example might be an excursion which requires the pupils to leave school an hour or so earlier than usual in the afternoon but involves them in an activity which does not end until quite late in the evening.

Residential visits

29. Section 106 defines a residential trip as a trip arranged for registered pupils by, or on behalf of, the LEA or the governing body and requiring pupils to spend one or more nights away from their usual overnight accommodation. It would not be practical to apply the 50% rule to any activity which involves nights away, since school hours will always take up considerably less than 50% of a 24 hour period. In these circumstances, section 107(3) bases the test upon the number of half days taken up by the activity — including travel — relative to the number of school sessions the participants would have attended had the activity not taken place. Whatever the starting and finishing times of the school day, regulation 10 of the Education (Schools and Further Education) Regulations 1981 requires that the school day be divided into two sessions. A "half-day" means any period of 12 hours ending with noon or midnight on any day.

30. If the number of school sessions missed by the pupils is less than 50% of the number of half days taken up by the activity, the activity is deemed to take place outside school hours. If the number of school sessions is 50% or more of the number of half days, the activity is deemed to take place during school hours.

31. Numbers of half days, or of school sessions, are to be rounded as follows: where 6 or more hours in a half day is spent on a residential trip, the whole of that half day counts as having been spent on the trip; where half or more of a school session is devoted to a residential trip, the entire session counts as having been spent on the trip. On this basis, a term-time trip from noon on Wednesday to 9pm on Sunday (ie 9 half days including 5 school sessions) would be deemed to take place in school hours, but a trip from noon on Thursday to 9pm on Sunday (ie 7 half days including 3 school sessions) would not.

32. Where a residential activity is deemed to take place during school hours, or comes within the criteria specified in paragraph 19, no charge may be made for the education provided, nor for the cost of travel, and any fund-raising must be on the basis of voluntary contributions. Charges may however be made for board and lodging: this is explained in the next section of the Circular.

VI. BOARD AND LODGING

Residential activities for day pupils

33. Where a school activity involves pupils in nights away from home, LEAs and governing bodies are permitted to make a charge for board and lodging, whether or not the activity is deemed to have taken place in school hours and whether or not it is covered by the criteria in paragraph 19. Any charges made must not, under section 109, exceed the actual cost of providing board and lodging for that pupil.

34. Special arrangements apply for pupils whose parents are in receipt of income support or family credit. Section 110 requires the LEA or governing body to remit any board and lodging charges in their case if the activity is deemed to take place in school hours, or if it is out of hours but covered by the criteria set out in paragraph 19. In other circumstances subsidy or remission is at the discretion of the body funding the activity (see paragraphs 52-55).

35. Schools may not always have comprehensive information about families where parents are in receipt of supplementary benefits. When a school intends to undertake an activity where a charge for board and lodging can be made and where section 110 applies, the headteacher should advise all parents that anyone in receipt of family credit or income support is entitled to claim remission. If the LEA or governors wish to adopt a more generous remissions policy than the statutory minimum, they will be free to do so.

Boarding schools

36. Section 111 essentially repeats and extends to grant-maintained schools the provisions on boarding education in section 61 of the 1944 Act. It allows LEAs or governing bodies to charge for board and lodging which they provide at LEA-maintained or grant-maintained boarding schools unless the pupil is being provided with that board and lodging because the LEA is of the opinion that education suitable to the pupil's age, ability and aptitude and to any special educational needs he may have cannot otherwise be provided for him. In the latter circumstances, the whole of the costs of board and lodging must be met by the LEA and not by the pupil's parents.

37● Where the LEA or governing body is permitted to make charges for board and lodging, and where the LEA believes that hardship will be caused if the parent is required to meet the full cost, the LEA has discretion to remit the whole or part of the costs. Where the pupil is in a grant-maintained boarding school, the LEA could reduce the charge to the parent by making appropriate payments to the governing body.

VII. TUITION IN THE PLAYING OF A MUSICAL INSTRUMENT

Free tuition

38. Section 3(2)(a) of the Act specifies music as a foundation subject within the National Curriculum. Under section 106, charging is not permitted for class music tuition or group musical activities within school hours. Music tuition, whether group or individual, must also be free if it forms part of the syllabus for a prescribed public examination or is required by the National Curriculum, whether it is provided within or outside school hours. Where the law requires that provision be free, parents cannot be required to purchase, or to meet hire costs for, musical instruments; to meet insurance costs relating to hire; or to provide music. They may be invited to provide instruments and music on a voluntary basis, so as to reduce pressures on the school budget, but only on the understanding that no child will be penalised because his or her parent does not contribute.

Discretionary charging for tuition

39. Where individual tuition in the playing of any musical instrument is available to pupils other than in the circumstances described above, section 106 permits a charge to be made. Where it is proposed to offer such tuition on the basis of charging for it, parental agreement must be obtained before a pupil is given that tuition. The charge can include the cost of the teacher giving the tuition as well as the cost of sheet music and the hire and insurance of a musical instrument. There is no obligation on the LEA or the governing body to provide the opportunity for pupils to receive individual instrumental music tuition.

Remission of charges

40. LEAs and governing bodies will be free to decide whether to remit charges for individual instrumental music tuition in cases of hardship. Where an LEA has determined that a charge should be made for individual instrumental music tuition, a governing body may decide to remit all or part of the charge from the funds at its disposal.

Vocal tuition

41. References in the charging provisions of the Act (and therefore in this Circular) to charging for tuition in playing a musical instrument do not apply to tuition in singing. Individual or group vocal tuition which is provided within school hours must be free. Where vocal tuition is provided outside school hours and is not required as an integral part of the syllabus for a prescribed public examination or by the National Curriculum, a charge may be made.

VIII. PUBLIC EXAMINATIONS

42. The Act distinguishes between

- (a) public examinations to be prescribed in regulations for which registered pupils should in no circumstances be charged for entry, whether the associated preparation is provided by the school in or out of school hours, and
- (b) other public examinations for which entry fees may be charged.

Prescribed public examinations

43. Section 106 prohibits certain charges in respect of prescribed public examinations for which registered pupils are being prepared at the school: the Secretary of State will specify these examinations shortly in regulations. No charge may be made for entering a pupil for a prescribed public examination. However if a parent asks for examination results to be rescrutinised, nothing in the Act prevents a school from passing on to the parent any charge which may be made by the examining body for this service.

44. Neither the pupil nor his or her parents may be required to supply or pay for any books, materials, instruments or other equipment to be used for the purposes of, or in connection with, the syllabus for a prescribed examination for which the pupil has been prepared. A pupil is regarded as having been prepared for the syllabus at the school if any part of the necessary preparation has been provided at the school. No charge may be made in respect of transport provided to enable the pupil to meet any requirement of the syllabus but a charge may be made in respect of board and lodging on a residential trip, with the necessary safeguards for hardship (paragraph 54).

45. Under section 117, the governing body is required to enter a pupil for each examination in a syllabus for a prescribed public examination for which the pupil has been prepared for entry by the school. The requirement can only be lifted where, in the opinion of the governing body, there are educational reasons for not entering the pupil for the examination or where the pupil's parents request in writing that the pupil should not be entered. Section 117(5) requires the governing body to inform parents in writing as soon as practicable after deciding for which examinations a pupil should be entered, so that parents have the opportunity to comment on the decisions. In practice, governors may wish to delegate to the headteacher the responsibility for determining whether there are educational grounds for not entering a pupil for an examination for which he or she has been prepared, and for informing parents of the decision. The LEA may not override the governors' decision on whether or not to enter a particular pupil for a particular examination. The Secretary of State may exercise his existing powers to intervene where there are grounds for believing that the governors have acted unreasonably.

46. Where the preparation provided by the school would enable a pupil to take two or more alternative examinations in syllabuses for prescribed public examinations, section 117(3) provides that the requirement to enter the pupil applies to a single examination entry only.

47. Where a governing body agrees to enter a pupil for a prescribed public examination for which he or she has not been prepared by the school, the cost of entering the pupil for the examination may be passed on to the pupil or his parents. This would apply, for example, where a pupil has received private tuition for the examination or where he is re-sitting an examination for which the school had earlier prepared him but where no additional preparation has been given

since the occasion of the first examination entry. Where the school has further prepared a pupil to re-sit a prescribed public examination it will be bound by the requirement to secure an examination entry, subject to the conditions described in paragraph 45, and no charge may be levied in respect of that entry (paragraph 43).

Other public examinations

48. Section 109 provides that if a pupil, with parental agreement, is entered for a public examination other than one on the prescribed list, that examination entry is to be considered as an "optional extra" and a charge may be made for the entry fee.

49. Under section 109(6), a charge may also be made for any costs associated with preparing the pupil for the examination if this preparation takes place outside school hours. The charge must not exceed the actual costs of the provision. When calculating such costs, no element should be included which is attributable to the school's teaching staff costs, unless those staff have been specifically engaged under contracts for services for the purpose of supplying the optional extra (see paragraph 24).

50. Any charges for the entry fee or for incidentals in respect of non-prescribed public examinations are a matter for decision by the LEA or governing body. They should include, in their remissions policies (paragraph 52), the criteria on the basis of which such decisions would be taken.

Recovery of wasted public examination fees

51. If a pupil fails without good reason to complete the examination requirements for any public examination for which the governing body or LEA has paid — or is liable to pay — an entry fee, then the fee can be recovered from the parent (section 108) regardless of whether the examination is prescribed. Failure to complete the examination requirements might include failure to complete the coursework requirements and/or failure to sit the final examination(s). It is for the LEA or governing body paying the fee to determine what constitutes a good reason and they may wish to lay down broad criteria in their charging and remissions policies.

IX. CHARGING AND REMISSIONS POLICIES

52. Earlier sections of this Circular have explained the circumstances in which LEAs and/or governing bodies have discretion to charge parents for educational provision or for board and lodging. Section 110 requires each LEA and governing body to draw up, and keep under review, its own policies in respect of charges and remission arrangements. Once the charging provisions of the Education Reform Act have been brought into force no charge can be levied by an LEA or governing body unless it has drawn up a statement of its policy. There is no legal requirement for LEAs to produce their policies in advance of schools, though in practice schools may want to see the LEA's statement before drawing up their own. The charging and remissions policies adopted by a school governing body may be more or less generous than the policies of the LEA, provided they meet the requirements of the law. Notes on what an LEA or governing body might need to consider in drawing up their statement are provided in the annex to this Circular.

53. The Act requires that the charging policy shall set out the provision and classes or descriptions of cases in which it is proposed to make charges.

54. The remissions policy shall set out the circumstances in which charges will be remitted in whole or in part. As a statutory minimum they should provide for complete remission of board and lodging charges to pupils whose parents receive income support or family credit, if the activity is deemed to take place during school hours or is out of school hours but is covered by the criteria in paragraph 19. Remissions policies for LEA-maintained schools should also indicate any circumstances in which the governing body propose to remit or subsidise any charges made by the LEA under its charging policy.

55. The Secretary of State will make regulations under section 118(5) requiring LEAs and governing bodies or headteachers to make available information about their charging and remissions policies. The regulations will specify the form and manner in which this information should be offered and when it should be available.

X. VOLUNTARY CONTRIBUTIONS

56. Section 118 establishes that the restrictions on charging for school activities do not in any way prohibit or restrict an LEA or school from seeking voluntary contributions for the benefit of the school or in support of any school activity, whether during or outside school hours, residential or non-residential.

57. Such contributions must, however, be genuinely voluntary. The terms of any request for contributions must make it clear:

- (a) that there is no obligation to contribute; and
- (b) that registered pupils at a school will not be treated differently according to whether or not their parents have made any contribution in response to the request.

58. If the activity cannot be funded without voluntary contribution, the governing body or head would want to make this clear to parents at the outset. An initial letter could explain the nature of the proposed activity and its likely value in educational terms. It could then indicate the contribution per pupil which would be required if the activity were to take place. It should emphasise that there is no obligation to contribute and that no pupil would be omitted from the activity because his or her parents were unwilling or unable to contribute, but it could be made equally clear that the activity would not take place if parents were reluctant to support it.

59. There is no limit to the level of voluntary contribution which parents or others can make to school activities, nor is any restriction placed upon the use which can be made of such contributions. A request for a contribution towards the cost of a particular activity could, for example, include the cost of subsidising pupils from low-income families, or the cost of travel for accompanying teachers. Alternatively, parents could be asked to contribute towards part of the cost at the time of the visit or activity, and the rest could be met from the proceeds of general fund-raising events held in preceding months. Some schools, for example, meet the transport costs of an excursion out of money raised from social events, then ask the parents of the children taking part in the excursion if they will help with other costs such as entrance fees.

XI. BREAKAGES AND FINES

60. There is no reference to breakages and fines in the Act's charging provisions. There is nothing to prevent schools from asking parents to pay for the cost of replacing a broken window or a defaced, damaged or lost text book where this is the result of a pupil's behaviour. Governing bodies are advised to include their policy on such matters in their discipline codes so that pupils and parents know where they stand.

XII. RECOVERY OF SUMS PAYABLE BY PARENTS

61. Section 118(6) provides that any sums payable by parents for wasted examination fees, for optional extras to which they had agreed, or for board and lodging, shall be recoverable summarily as a civil debt.

XIII. COMMENCEMENT

62. The Education Reform Act (Commencement No. 2) Order 1988 provides that the charging sections of the Act will be brought into force — and section 61 of the 1944 Act thereby repealed — with effect from 1 April 1989. Regulations listing the prescribed public examinations and making provision for information about school hours and about LEAs' and governors' charging and remissions policies will be made by that date.

63. Section 61 of the 1944 Act will continue in force until its repeal. The provisions described in this Circular, as they relate to the 1988 Act, do not operate retrospectively. Any charges made for school activities before 1 April 1989 should take account of the Secretary of State's understanding of the scope of section 61, as set out in paragraphs 2-4 of this Circular.

XIV. CHARGING IN CITY TECHNOLOGY COLLEGES AND CITY COLLEGES FOR THE TECHNOLOGY OF THE ARTS

64. The charging provisions of the Education Reform Act relate to maintained schools and therefore do not apply to City Technology Colleges (CTCs) or City Colleges for the Technology of the Arts (CCTAs) because these are independent schools run by charitable trusts. Section 105 of the Education Reform Act allows the Secretary of State to enter into funding agreements with anyone establishing a CTC. Section 105 also provides that any payments made by the Secretary of State under such agreements depend on the fulfilment of conditions that no charges are made either for admission to the school or, subject to exceptions specified in the agreement, for education provided at the school. It is intended that CTCs will have the same discretion to charge in specified circumstances as maintained schools and this intention will be reflected in funding agreements.

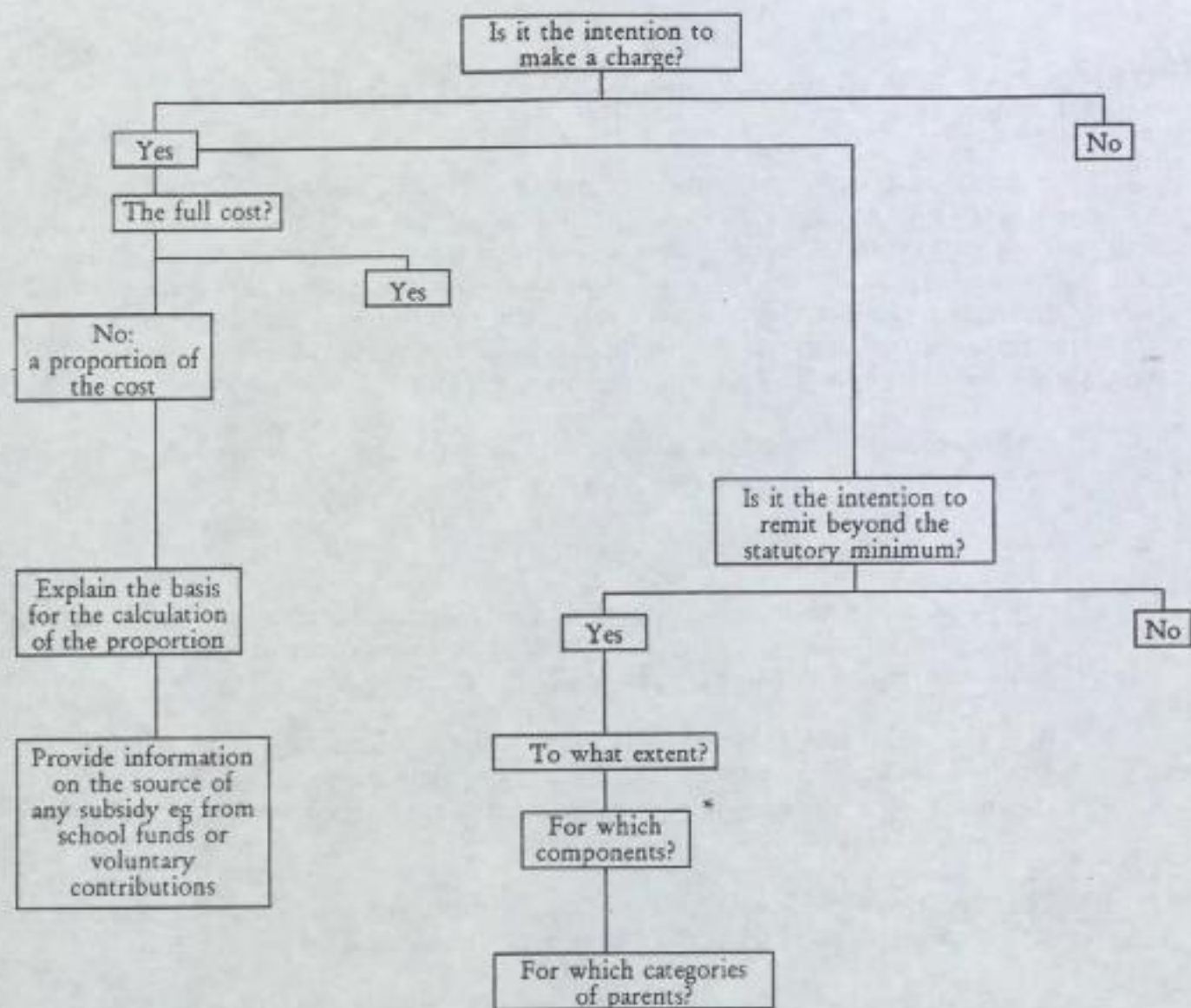
D.J.S. Hancock

D J S HANCOCK

STATEMENTS OF CHARGING AND REMISSIONS POLICIES BY LEAs AND GOVERNING BODIES

1. Under the charging provisions of the Education Reform Act, LEAs and governing bodies may choose to charge for certain defined activities, but only if they have first drawn up a statement of their charging and remissions policy. If they choose to charge parents for the board and lodging costs of a residential visit, and if the education provided on that visit must otherwise be provided free under the terms of the Act, they must as a minimum remit the board and lodging costs for pupils whose parents are in receipt of income support or family credit. Otherwise, remission, like charging, is at the discretion of the LEA or governors.
2. When drawing up their statements, LEAs and governing bodies will wish to remember that charging is permissible for the following areas of activity:—
 - i. Board and lodging on residential visits.
 - ii. Costs associated with individual tuition in the playing of a musical instrument whether in or out of school hours (unless it is provided as part of the syllabus for a prescribed public examination or is required by the National Curriculum).
 - iii. Activities which take place wholly or mainly outside school hours, but which are not provided as part of the syllabus for a prescribed public examination and are not required in order to fulfil statutory duties relating to the National Curriculum or to religious education.
 - iv. The cost of entering a pupil for a public examination not prescribed in regulations, and for preparing the pupil for such an examination outside school hours.
 - v. Re-sits of prescribed public examinations where no further preparation has been provided by the school.

3. For each of the areas above the LEA or the governing body will need to determine its policy on the following basis:—



*For example where music tuition is concerned schools might wish to remit the teaching costs but not instrument hire etc.



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10 DOWNING STREET

LONDON SW1A 2AA

From the Private Secretary

9 January 1989

Dear Stephen

NATIONAL CURRICULUM: HISTORY

The Prime Minister has seen your Secretary of State's minute of 14 December setting out his proposals for the Welsh Committee. She is content with the proposals in your Secretary of State's minute.

A copy of this letter goes to Philip Mawer (Home Office), Clive Norris (Department of Employment), Neil Thornton (Department of Trade and Industry), Tom Jeffery (Department of Education and Science), David Crawley (Scottish Office), Mike Maxwell (Northern Ireland Office), Eleanor Goodison (Office of the Minister for the Arts), Philip Stamp (Office of the Minister for Sport) and to Trevor Woolley (Cabinet Office).

Yours sincerely

Dominic

Dominic Morris

Stephen Williams Esq
Welsh Office.

KB



file DFJ
"B9"

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

9 January 1989

Dear Tom

NATIONAL CURRICULUM: HISTORY

The Prime Minister has seen your Secretary of State's minute of 5 January. She still feels that the definition of the task for the History Working Group remains vague. Provided, however, that the Group has to follow the supplementary guidance in annex B in interpreting its terms of reference at annex A, which you confirmed was the case, the Prime Minister is content with the revised membership and guidance for the Group. She is also content with the outline timetable for the establishment of future national curriculum groups as set out in your Secretary of State's December minute.

A copy of this letter goes to Stephen Williams (Welsh Office), Philip Mawer (Home Office), Clive Norris (Department of Employment), Neil Thornton (Department of Trade and Industry), David Crawley (Scottish Office), Mike Maxwell (Northern Ireland Office), Eleanor Goodison (Office of the Minister for the Arts), Philip Stamp (Office of the Minister for Sport) and to Trevor Woolley (Cabinet Office).

Yours ever
Dominic

Dominic Morris

Tom Jeffery Esq
Department of Education and Science.

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PRIME MINISTER

NATIONAL CURRICULUM HISTORY WORKING GROUP: ANNOUNCEMENT

I have had further discussions over the establishment of a History Working Group.

I am pleased to report to you that I have secured the services of a distinguished historian, Dr John Roberts, the Warden of Merton College, Oxford University. I am sure that he will add great strength to the Group's deliberations. At the same time I have decided not to include Mr D Shemilt in the list of those to whom I should like to offer formal appointments. The full list of proposed membership is at Annex C.

I have also made some drafting changes to the supplementary guidance issued to the Chairman of the Group. These are shown, side-lined, at Annex B.

The terms of reference remain as already advised in my minute of 14 December but I attach a copy at Annex A for ease of reference.

If you are content with the revisions, Peter Walker and I should like to make an announcement next week, as soon as possible after Parliament re-assembles. As I mentioned in my minute of 14 December we should like at the same time to announce the outline timetable for the establishment of future Working Groups. I hope this is acceptable to you.

ACW

I am sending copies of this letter to Peter Walker, Douglas Hurd, Norman Fowler, David Young, Malcolm Rifkind, Tom King, Richard Luce, Colin Moynihan and to Sir Robin Butler.

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Department of Education and Science

5 January 1989

NATIONAL CURRICULUM HISTORY WORKING GROUP

TERMS OF REFERENCE

Background

1. The Education Reform Act 1988 provides for the establishment of a National Curriculum of core and other foundation subjects for pupils of compulsory school age in England and Wales. The Act empowers the Secretary of State to specify, as he considers appropriate for each foundation subject, including history, that there should be 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 statutory framework which is known to all. It is the task of the Working Group on History to advise on that framework for history.

The Task

3. The Working Group is asked to submit an interim report to the Secretaries of State by 30 June 1989 outlining and, as far as possible, exemplifying:

- i) the contribution which history 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; and the profile components into which attainment targets should be grouped;
- iii) its thinking about the programmes of study which would be consistent with the attainment targets provisionally identified; and
- iv) the key elements within those programmes of study that it considers to be essential at each key stage for children throughout England and Wales, bearing in mind the need for a balanced history curriculum for all pupils and, in Wales, the need to allow room within that curriculum for appropriate attention to the History of Wales.

4. By Christmas 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 history.

Approach

5. In carrying out its task the Group should consult informally and selectively with relevant interests and have regard to the work of other subject groups, in particular those on English, Welsh and, in due course, on geography. Additionally the Group should take account of:

- i) the broad framework for assessment and testing announced by the Government on 7 June 1988 and subsequent development of it in the light of advice from the School Examinations and Assessment Council;
- ii) the contributions which history can make to learning about other subjects and cross-curricular themes, and which they in turn can make to learning in history;
- iii) best practice and the results of any relevant research and development;
- iv) the work of the History Committee for Wales (HCW); and
- v) the issues covered in the supplementary guidance to the Group's Chairman.

SUPPLEMENTARY GUIDANCE TO THE CHAIRMAN OF THE HISTORY WORKING GROUP

1. This note amplifies some of the points outlined in the Working Group's terms of reference.

Attainment Targets and differentiation

2. The attainment targets are expected to provide specific objectives so that pupils, teachers, parents and others 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, particularly for pupils in the first two key stages, 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. They should raise expectations, particularly of pupils of middling and lower ability, 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, the Working Group should attempt to cover all areas of history 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 history curriculum which takes account of what may be expected of pupils of different abilities.

4. The study of history in schools should help pupils come to understand how a free and democratic society has developed over the centuries. The programmes of study should have at the core the history of Britain, the record of its past and, in particular, its political, constitutional and cultural heritage. They should take account of Britain's evolution and its changing role as a European, Commonwealth and world power influencing and being influenced by ideas, movements and events elsewhere in the world. They should also recognise and develop an awareness of the impact of classical civilisations. Overall, they should help pupils to acquire and develop an historical approach based on objective analysis of evidence while remaining consistent with Sections 44 and 45 of the Education (No 2) Act 1986 which prohibits political indoctrination and requires balanced presentation of opposing views.

5. Bearing in mind the general objectives described in paragraph 4 above, the programmes of study should give proper emphasis at each key stage to the content of historical knowledge and lay the foundation for the progressive development of the processes and skills of historical inquiry. They should foster: a sense of place and time; a grasp of chronology and historical techniques; and the capacity for historical understanding based on sound evidence. They should assist the progressive acquisition of skills in the collection, objective analysis, interpretation, discriminating use and reporting of evidence from a variety of sources. Above all, the programmes of study should seek to reveal to pupils that history is interesting, exciting and enjoyable, enabling teachers to draw imaginatively on a wide variety of teaching materials and historical sources, including appropriate local sources.

6. 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 history to the overall curriculum.

Special Needs

7. The Education Reform Act 1988 provides 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 that individual pupil. In addition, Orders or regulations under the 1988 Act can define the cases or circumstances in which the application of the national curriculum provisions may be modified or disapplied for any foundation subject. The Working Group should consider and advise on whether any such adaptations would be appropriate and justified in the case of history.

Links with other subjects

8. By its nature, history has links with many subjects across the curriculum. It both contributes to learning in other areas and is itself promoted by work in those fields. It can benefit from knowledge and skills related to, for example, mathematics, information technology, statistics and economics. There are clear links, particularly with English and Welsh, science, geography and technology; with art, music and foreign languages and with areas such as classical studies. The Working Group should take these and any other reciprocal connections into account in its recommendations for attainment targets, programmes of study and related assessment arrangements for history, bearing in mind in particular that all subjects should promote the development

of good written English and numeracy. The overriding consideration should be that clear attainment targets and programmes of study that ensure continuity and coherence in what is taught and learnt are set for history.

Ages and Stages; Time Allocations

9. The Working Group should assume that all pupils, other than those few whose statements of special educational need under the Education Act 1981 specify otherwise, will study history throughout their compulsory schooling and many are likely to take a GCSE in history or a subject which will involve a substantial element of history approved against relevant GCSE criteria.

10. In framing its recommendations the Working Group should assume that in England normally the equivalent of some 3-4 periods of a 40 period weekly timetable, or the equivalent of that in eg primary schools which do not organise a timetable in periods, will be available for history, during primary schooling and for years 1-3 of secondary school. Beyond that stage the amount of time required will depend upon whether a GCSE or equivalent examination course in history is being followed. Where it is, the Group should assume, for a pupil in years 4 and 5 of secondary school, on average 4 periods. For other courses, including non-examination courses, the Group should assume that on average 2 periods a week will be available for history; the essential requirement is that the history studied should provide for worthwhile progress beyond what has already been achieved at the end of key stage three.

Assessment

11. 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 steps. The targets, and the associated criteria for successive levels of attainment within them, should therefore be sufficiently clearly specified so that they are capable of assessment and each conveys a unique description of the required performance, regardless of the age at which it is reached.

12. 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 for assessment and testing announced by the Government on 7 June 1988 in response to the reports of the Task Group on Assessment and Testing which included recommendations for the work of subject groups. In particular the Working Group should offer advice in broad terms about assessment and testing in relation to the attainment targets recommended, the grouping of those targets for purposes of reporting the results of assessment, and in particular what might appropriately be measured by nationally prescribed tests.

GCSE

13. Not all pupils will take GCSE examinations in history as such. However, in defining attainment targets and programmes of study the Working Group should take account of the GCSE National Criteria for history and other subjects with a history element - including in particular classical studies - so far as these are consistent with the approach in the terms of reference. The School Examinations and Assessment Council will be asked to advise on whether, and if so how, the GCSE criteria need to be revised to reflect the national curriculum attainment targets and programmes of study for ages 14-16, and to approve syllabuses accordingly.

General Principles

14. 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

15. It will be important to bear in mind that the curriculum should provide equal opportunities for boys and girls. The Group should also take account of the ethnic diversity of the school population and society at large. Further guidance will be given on particular points to be considered in order to avoid unnecessary difficulties for children with special educational needs.

Wales

16. The Group will need to bear in mind that the Secretary of State for Wales wishes them to produce a framework of profile components, attainment targets and programmes of study which would be usable, with the necessary

adaptation, in Wales. He has established a History Committee for Wales which is asked to take account of that framework in its work. Initially it is to produce advice, by 30 June 1989, giving outline recommendations for the content of Welsh history and its views on the extent to which Welsh perspectives should influence the wider study of history. For its final report, due by the end of March 1990, the Committee is asked to recommend a balanced overall curriculum for history in Wales, in the light of the final recommendations of the History Working Group. The History Working Group will need from the outset to liaise closely with the Committee on History for Wales. The Committee's final report is intended to form the basis of the Secretary of State for Wales' consultations and draft Orders.

Implementation

17. The Government intends to make orders under the 1988 Act requiring the core and foundation subjects to be taught from September 1989 to all pupils for a reasonable time in each of the first three key stages (i.e. ages 5-14): this will include history. Pupils who will then be in the fourth key stage (14-16) will already have made GCSE course choices, and the requirement will not therefore be extended to them until a later date, probably Autumn 1990 for those in the fourth year and Autumn 1991 for those in the fifth year.

18. No decisions have yet been taken on when attainment targets and programmes of study should be introduced for history: these will be influenced by the Working Group's advice.

PROPOSED MEMBERSHIP OF THE NATIONAL CURRICULUM HISTORY
WORKING GROUP

Chairman: Cdr L M M Saunders Watson,
Chairman of the Heritage Education Trust
Former President of the Historic Houses Association

Members: Mr R M Guyver,
Wembury Primary School,
Plymouth,
Devon

Mrs C White,
Garth Hill Comprehensive School,
Bracknell,
Berkshire

Dr J M Roberts,
Merton College,
Oxford University

Mrs A Low-Beer,
University of Bristol

Dr A Prochaska,
Institute of Historical Research,
University of London

Mr J Hendy,
Chief Education Officer,
Stockport LEA,
Cheshire

Mr P Livsey,
Adviser on History and Geography
County Durham LEA

Mr H Hobhouse,
Author,
Castle Cary,
Somerset

Dr G Elwyn Jones
University College, Swansea
(also member of History Committee for Wales)

EDUCATION POLICY
R. 20

Prime Minister

The answer to your query is that Annex B does have to be taken in parallel with Annex A. Content now with the three points agreed?

PRIME MINISTER

NATIONAL CURRICULUM: HISTORY

Ph: 6
61

You will recall you saw shortly before Christmas Mr. Baker's original proposals for the History Working Group. Following advice from Brian Griffiths you were most concerned about the proposed membership, in particular [redacted] You asked Brian to seek to resolve this with Kenneth Baker.

Mr. Baker's latest minute of 5 January (Flag A) represents the outcome of those discussions. It is now proposed that Dr. John Roberts should take the place of [redacted] and some important drafting changes to the supplementary guidance to the Working Group have been made. Brian strongly supports these revised proposals both on membership and drafting of the guidance.

There are also two further outstanding issues. At the end of Kenneth Baker's earlier minute (Flag B) he set out his proposals for the outline timetable for the establishment of groups on other foundation subjects in the national curriculum, involving implementation for geography from autumn 1991, for modern foreign languages by autumn 1992, and for music, art and physical education from autumn 1992. You need to consider whether you are content with this timetable. If it can be achieved - yes. Brian Griffiths has no comments.

Finally, there needs to be a parallel history committee covering the history and culture of Wales. Peter Walker's minute of 14 December (Flag C) sets out proposals that:

- The Welsh Committee should be chaired by Professor Robert Rees Davies.
- There should be common membership of the main Working Group and the Welsh Committee in the person of Dr. Gareth Elwyn Jones.

TEMPORARILY RETAINED 5. Gray 30/7/2016

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You will wish to consider whether you are content with these proposals. *Brian is content.*

Content:

- (i) With the revised membership and guidance for the History Working Group as set out at Annex A?
- (ii) With the outline timetable for the establishment of future national curriculum groups as set out at the end of Mr. Baker's earlier minute at Flag B?
- (iii) With the proposals for a Welsh Committee set out at Flag C?

Yes

Yes

Paul Gray

PAUL GRAY
5 January 1989

*I thought - our
purpose was to tell them
some of the things that
must be done. The degree
of 'The Testis' is very
 vague. I trust the group
has to follow Annex B in
inter-ship Annex A?*

KKIAJA



File M17
pps with PG

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

4 January 1989

Dear Sean,

CURRICULUM CENTRES

As you will know Mrs. Rumbold is coming to see the Prime Minister at 12 noon on Wednesday 11 January to discuss points raised with the Prime Minister by her constituent Mr. R. A. Fensome. It may be helpful for you to have the enclosed background papers on this case, including some background briefing provided by your Department for Mr. Fensome's surgery meeting with the Prime Minister.

*Yours sincerely,
Paul Gray*

PAUL GRAY

Sean Scott, Esq.,
PS to Angela Rumbold, MP
Department of Education and Science

SG

CONFIDENTIAL



see below

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

19 December 1988

TEACHER TRAINING AND HIGHER EDUCATION

The Prime Minister has considered the Education Secretary's minute of 12 December about teacher training and universities. She has commented that the Value for Money seminar is concerned with the effectiveness of departmental spending and is not the place to discuss policy issues. She suggests that Mr. Baker might wish to discuss his ideas with her in the first place and then put papers on both issues to E(EP) in the spring.

C. D. POWELL

AK

Tom Jeffery, Esq.,
Department of Education and Science.

CONFIDENTIAL



10 DOWNING STREET

From the Principal Private Secretary

Note for the Record

B.G. went to see Mr. Baker who
agreed to drop Dr. Shenilt and to find
a history professor in his place. Mr. Baker
will also redraft the statement, -
consultation with B.G. Timing unclear

AT

19/12

PRIME MINISTER

TEACHER TRAINING AND HIGHER EDUCATION

You will recall you sent a personal minute to Mr. Baker asking him to prepare papers for the E(EP) meeting on teacher training and universities (flag A).

Mr. Baker has now responded (flag B), and Brian Griffiths has offered comments (flag C).

Mr. Baker is resisting the idea of going straight to E(EP) and wants to come to you first bilaterally on these issues. He mentions the VFM seminar on 11 January as one possibility. Brian recommends that the VFM seminar is the wrong forum for this sort of discussion, and sees no attraction in handling these policy issues in E(EP). I agree.

Content to respond to Mr. Baker's minute by saying:

- the VFM seminar should be used to present the effectiveness of Departmental spending, not to discuss these policy issues;
- you would still like him to put papers on both these issues to E(EP) in the spring?

PLG

PAUL GRAY

16 December 1988

Yes - but he is welcome to come and discuss his ideas first

Britain must speak
to Kenneth Baker urgently.

PRIME MINISTER

Walter Hill

16 December 1988

"Government now & his group will do the
job. not

NATIONAL CURRICULUM: HISTORY WORKING PARTY

Kenneth Baker's proposals for the teaching of history and
the composition of the History Working Group are extremely
disturbing.

His guidance for the history working group, while laying
some emphasis on content, would in fact enshrine what has
come to be called the New History in the national
curriculum! This is precisely the opposite of what was
intended when you set up a national curriculum.

He proposes no major historian or academic for membership of
the Working Party: what I find quite incredible is that he
proposes

TEMPORARILY
RETAINED

G. Gray

30/7/2016

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OF THE PUBLIC RECORDS ACT

(Flag A-C) The Historical Association have also
written critically about these trends.

Recent Trends and the New History

The Historical Association sum up in a fair way what has
happened since the 1960s.

"The importance of History in our lives is recognised by
all, but in this country its place in the school curriculum
is declining. Many pupils study it only in disjointed
fragments as part of various 'Humanities' themes, and about
half drop it entirely at the age of 14.

Until the mid-1960s, History was regarded as central to the curriculum on the Arts side, and it was normal practice for a school syllabus to consist of British (or English) History from beginning to end, plus a period of European History, each taught in a narrative way with much rote-learning. In the mid-1960s, the advent of CSE gave the opportunity to design many new syllabuses based upon British Social and Economic History and World History. In the 1970s, the Schools Council Projects moved the focus from content to the skills and concepts which History should teach. The National Criteria of 1986 show how there is now a consensus that pupils should be expected to analyse and evaluate sources, to understand what is evidence, to appreciate the perspective of people in the past, and to comprehend change and continuity through time. But there is no consensus about content. In this respect the United Kingdom is quite unusual amongst EEC countries, most of which expect pupils to know something of the history of both their own country and of Europe."

Unlike traditional pre-mid 1960s teaching of history, the modern approach aims at novel ways of communicating the subject to "satisfy the personal and social needs of adolescents" (!), lays great emphasis on concepts rather than knowledge and chronology, and uses empathy in particular as a way of understanding. The CPS publication, Errors and Evils of the New History, is a stinging attack of this whole approach. (Flag A)

Clearly the last thing we want is for the history national curriculum to enshrine the very weaknesses which led you to reform education in the first place!

Two key steps need to be taken.

(a) Guidance for the Working Party

First the Working Party needs clearer guidance.

At present the document suffers from four major weaknesses.

First, the objective of history which is set out is open to misinterpretation eg it suggests that history is to

This is far - logic - "help pupils acquire and develop values based on objective analysis of evidence".

swirl - How can they evaluate "non-evidence" of history - because we cannot make a

Unfortunately this would fit nicely into a Marxist let alone a liberal view. If history teachers felt they were there to teach values there would be no stopping those who were zealots. And all of it having a statutory basis!

balanced assessment except by balanced evidence

Helping children develop values is a laudable aim but the first and major step in history, which is never clearly laid out, is that it is simply the story of the past! The facts and the record are critical. (The article by Professor Kenneth Minogue from the TES, is excellent on this point.

(Flag D))

Second the programmes of study which are proposed are subject to the usual HMI/DES jargon which is simply a camouflage for the New History eg to

"lay the foundation for the progressive development of the processes and skills of historical inquiry. They should foster: a sense of place and time and a grasp of chronology and historical terminology ..."

Third far too much emphasis is given to cross-curricular learning. It is specifically stated that history should not be taught as a separate subject (underlined by DES).

✓ Fourth it is too broad and a recipe for a disastrous curriculum.

We are told it is relevant to "developing economic understanding, political and civic education, participation in a multi-ethnic society, European and wider awareness of the world, aesthetic and creative capacities and personal and social education generally".

✓ This kind of statement is open to abuse by any group of trendy teachers who care to hijack it to suit their own whims. It is precisely what the national curriculum should exclude and not include.

(b) Membership of the Working Party

The Chairman - Commander L M M Saunders Watson, may have a family interest in the history of our nation and a professional interest in historic houses, but I fear he may be eaten alive by the likes of

I suggest that Kenneth Baker has already sounded him out about being Chairman. If he could be more Deputy-Chairman it would be a great step forward.

If, however, you keep the Chairman, the following action is essential:

- _____ must be removed
- the credentials of other members of the Working Party need to be checked out
 - you need to add at least three names which you choose and who you know are reliable.

TEMPORARILY RETAINED S. Gray 30/7/2016

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OF THE PUBLIC RECORDS ACT

It would be good to have an outstanding history master from a northern grammar school and at least two well-known academics, at least one of whom is a historian.

I would suggest very strongly that Professor Kenneth Minogue be included. He would make an outstanding contribution. He has a great record in this area and one should discount opposition to him because of his conservative views.

Possible historians include:

Professor Geoffrey ELTON (formerly Regius Professor at Cambridge)

Professor Derek BEALES (Professor of Modern History at Cambridge)

Both of these are uncontentious and their books are already read by schoolchildren.

Other names include:

Professor David DILKES (Professor at Leeds)

Professor Elie KEDOURIE (LSE and quite outstanding)

Dr John MORRILL (Selwyn Cambridge and who does a lot with schools)

Dr Michael BENTLEY (Sheffield)

Recommendations

- 1 We need new guidance on history for the Working Party and a clearer statement of aims.
- 2 We need a strong chairman who commands respect in the

world of history. This points to a professional academic historian. Commander Saunders Watson would be a good deputy chairman.

- 3 We need to remove at least one existing name and add others.
- 4 This suggests that the Secretary of State will not be able to make his announcement until mid-January.

Brian Griffiths

BRIAN GRIFFITHS

PRIME MINISTER

15 December 1988

TEACHER TRAINING AND HIGHER EDUCATION

Kenneth Baker has now responded to your personal minute on teacher training and higher education.

In his reply he mentions some interesting developments taking place on both fronts, makes many declarations of good intent, but is not very specific about producing papers.

Teacher Training

The consultation period on 'Qualified Teacher Status' finished at the end of November. It is very clear from the Secretary of State's reply that the DES has been doing a lot of thinking in this area. He says that he will let you have further thoughts on these issues. I believe the appropriate response would be to welcome the reforms which are in hand, and to invite a paper for E(EP) sometime in second half of February or early March, which puts forward options for the way ahead.

Higher Education Generally

He mentions that work is in hand on the development of more radical policies. This has been going on ever since the last election. Indeed, I remember discussing work within the Department well before the White Paper on Higher Education was published in April 1987!

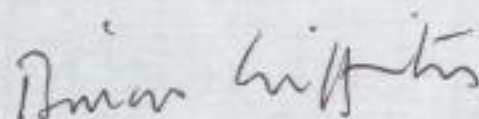
I really think that however much work remains to be done, the DES has done sufficient work to date for us to have an informed discussion of the way forward.

Once again, I believe that Kenneth Baker now needs to be pinned down to producing a comprehensive paper for colleagues rather than to set up another bilateral. It may be that a meeting of Ministers would be more appropriate than a meeting of E(EP), but I am sure that any decision which needs to be made in the New Year would benefit considerably from a discussion with colleagues.

Value for Money Seminar, 11 January

It is surely important that the Secretary of State uses this particular seminar to present the effectiveness of the Department rather than to discuss yet another set of objectives. The seminar is about results more than objectives.

If objectives relate to new policies, then there are far more appropriate places in which to discuss them, such as a meeting of Ministers. Value for money must not be confused with policy design.



BRIAN GRIFFITHS

EDUCATION
Policy pt 20

PRIME MINISTER



CCP12
C

NATIONAL CURRICULUM: HISTORY

below.

Kenneth Baker has minuted you about our proposals for a History Working Group and the necessary arrangements for Wales.

The Welsh context for this goes back to our publication on "The National Curriculum in Wales" where we gave the commitment that the national curriculum would take account of the History and Culture of Wales, placing it in the context of a balanced view of Wales' role as a part of the United Kingdom and the wider world. In applying this to History, I want to see a common framework with England avoiding unnecessary divergence while giving a proper but not excessive attention to the History of Wales.

Kenneth and I are agreed that it would overburden the History Working Group to ask it to produce a variant of the curriculum for Wales. We therefore propose that I should appoint a Committee, working within the framework of attainment targets and programmes of study recommended by the History Working Group. The Committee will need to produce a balanced overall History Curriculum for Wales on which I can conduct the necessary consultation process leading to Orders. To do this it will need a little more time - I propose to give it until April 1990 - to take account of the final report of the History working Group. The Committee and the working Group will need close liaison and I propose that Dr Gareth Elwyn Jones, Reader in History in the Department of Education at the University College of Wales, Swansea, should be a member of both groups.

As Chairman of the Committee I propose to invite Professor Robert Rees Davies, Professor of History at the University College of Wales, Aberystwyth.

... I attach a copy of the terms of reference I propose to give the Committee.

I am sending copies of this minute to Kenneth Baker, Douglas Hurd, Norman Fowler, David Young, Malcolm Rifkind, Tom King and to Sir Robin Butler.

14 December 1988

P W

NATIONAL CURRICULUM HISTORY COMMITTEE FOR WALES

TERMS OF REFERENCE

Background

1. The Education Reform Act 1988 provides for the establishment of a National Curriculum of core and other foundation subjects for pupils of compulsory school age in England and Wales. The Act empowers the Secretary of State to specify, as he considers appropriate for each foundation subject, including history, that there should be 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 statutory framework which is known to all. It is the task of the Working Group on History to advise on that framework for history.
3. The History Committee for Wales is asked to liaise closely with the History Working Group and to submit preliminary advice to the Secretary of State by 30 June 1989 outlining:-
 - i. the content of Welsh History which should be incorporated into the history curriculum in Wales;
 - ii. its preliminary views on the extent to which Welsh perspectives should influence the wider study of history.

4. By 30 April 1990 the History Committee for Wales is to submit to the Secretary of State a final report setting out and justifying a balanced and complete curriculum for history in Wales, in the light of the final recommendations of the History Working Group.

Approach

5. In carrying out its task the Committee should consult informally and selectively with relevant interests and have regard to:-

- i. the terms of reference, supplementary guidance, ongoing work and Interim and Final Reports of the History Working Group;
- ii. the broad framework for assessment and testing announced by the Government on 7 June 1988 and subsequent development of it in the light of advice from the School Examinations and Assessment Council;
- iii. the contributions which history can make to learning about other subjects and cross-curricular themes, and which they in turn can make to learning in history;
- iv. best practice and the results of any relevant research and development.

~~with a~~

This will do

at all. Better not have a core curriculum than one based on this.



Prime Minister

Policy Unit have important reservations on these proposals. Agree to Baker be asked to look again at some aspects, even at cost of delay until after Christmas?

AT 16/12

PRIME MINISTER

NATIONAL CURRICULUM HISTORY WORKING GROUP: ANNOUNCEMENT

Put Alan Beattie let them
Let's try to let them

We had a brief word on 26 October and I agreed to bring forward my proposals for the establishment of a History Working Group to make recommendations on attainment targets and programmes of the study.

Ask Brian to talk to core curriculum

Proposed terms of reference and supplementary guidance for a Working Group covering history in England and Wales are attached at Annexes A and B. These are agreed with Peter Walker. They follow closely those agreed with colleagues for the earlier Curriculum Working Groups. You will see that we have set British history at the core of what is to be recommended. But we also need to reflect the special position of history in Wales. Peter Walker is minuting you separately on his proposal to set up a History Committee for Wales.

Angela and I have interviewed a number of potential candidates for membership of the History Working Group and I should like formally to offer appointments to the Chairman and Members as set out in Annex C. I set particular store by the appointment of Commander Saunders Watson as an independent and strong Chairman and have kept the size of the Group to the minimum necessary satisfactorily to undertake the task I have set within an exacting timetable.

If you are content, Peter Walker and I should like to announce the establishment of a Working Group on History and a History Committee for Wales, by arranged PQs, before the Christmas Recess. The Group and Committee would be expected to report in time to enable first implementation in schools in Autumn 1991.

An announcement about a History Working Group will certainly raise questions about our intentions for other foundation

subjects and the overall timetable for implementation. I believe that we must say when we intend to start action on geography, which many people - rightly in my view - believe needs to be considered alongside history. We also need to make clear that we are taking action on modern foreign languages in time to start influencing the standards of language teaching in our schools in 1992. But if we announce forward plans on these subjects, we can expect considerable pressure to declare our intentions on music, art and physical education also - and I know that Richard Luce and Colin Moynihan are anxious that we should be seen to be giving these subjects due attention. I think that we must outline when we intend to act, though not how we shall take work forward to produce guidelines, on those three subjects also.

I am statutorily obliged to establish a complete National Curriculum - ie one which states our expectations for all the foundation subjects - as soon as is reasonably practicable. We have given the new National Curriculum Council the task of considering the whole curriculum and the way in which the National Curriculum fits into it, and in order to do that they need to know our intentions. Above all, I am anxious to keep up the momentum of implementation and to make clear to schools what they may expect to happen over the next few years, so that they can plan ahead effectively in their organisation of the curriculum and in considering their staffing requirements.

I should therefore like to announce, at the same time as we announce the setting up of a History Working Group, that our outline timetable for the establishment of future Groups and for implementation of new requirements in schools is:

Geography - establish Working Group Easter
1989
- first implementation in schools
Autumn 1991;

Modern Foreign - establish Working Group July 1989

Languages - first implementation in schools Autumn 1992
at the latest;

Music, Art and - set in place arrangements for considering the
Physical content of guidelines in June 1990

Education - first implementation in schools Autumn 1992.

I believe that this timetable is realistic and will be generally welcomed by most people in the education service, who are now anxious to make progress in planning for implementation of the full National Curriculum. It will ensure that the intended substance of the entire National Curriculum is public by mid-1991. The timetable has been agreed with Peter Walker and there should be no differences in the timing of implementation in Wales.

I should be grateful to know whether you or colleagues see any difficulty in my making such an announcement. You should be aware that Geoffrey Dickens has already tabled a PQ on this subject for oral answer on 20 December.

I am sending copies of this letter to Peter Walker, Douglas Hurd, Norman Fowler, David Young, Malcolm Rifkind, Tom King, Richard Luce, Colin Moynihan and to Sir Robin Butler.

K.D.

KB

Department of Education and Science

December 1988

NATIONAL CURRICULUM HISTORY WORKING GROUP

TERMS OF REFERENCE

Background

1. The Education Reform Act 1988 provides for the establishment of a National Curriculum of core and other foundation subjects for pupils of compulsory school age in England and Wales. The Act empowers the Secretary of State to specify, as he considers appropriate for each foundation subject, including history, that there should be 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 statutory framework which is known to all. It is the task of the Working Group on History to advise on that framework for history.

The Task

3. The Working Group is asked to submit an interim report to the Secretaries of State by 30 June 1989 outlining and, as far as possible, exemplifying:

- i) the contribution which history 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; and the profile components into which attainment targets should be grouped; ??
- iii) its thinking about the programmes of study which would be consistent with the attainment targets provisionally identified; and
- iv) the key elements within those programmes of study that it considers to be essential at each key stage for children throughout England and Wales, bearing in mind the need for a balanced history curriculum for all pupils and, in Wales, the need to allow room within that curriculum for appropriate attention to the History of Wales.

4. By Christmas 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 history.

Approach

5. In carrying out its task the Group should consult informally and selectively with relevant interests and have regard to the work of other subject groups, in particular those on English, Welsh and, in due course, on geography. Additionally the Group should take account of:

- i) the broad framework for assessment and testing announced by the Government on 7 June 1988 and subsequent development of it in the light of advice from the School Examinations and Assessment Council;
- ii) the contributions which history can make to learning about other subjects and cross-curricular themes, and which they in turn can make to learning in history;
- iii) best practice and the results of any relevant research and development;
- iv) the work of the History Committee for Wales (HCW); and
- v) the issues covered in the supplementary guidance to the Group's Chairman.

SUPPLEMENTARY GUIDANCE TO THE CHAIRMAN OF THE HISTORY WORKING GROUP

1. This note amplifies some of the points outlined in the Working Group's terms of reference.

Attainment Targets and differentiation

2. The attainment targets are expected to provide specific objectives so that pupils, teachers, parents and others 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, particularly for pupils in the first two key stages, 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. They should raise expectations, particularly of pupils of middling and lower ability, 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, the Working Group should attempt to cover all areas of history 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 history curriculum which takes account of what may be expected of pupils of different abilities.

4. The study of history in schools should help pupils come to understand how a free and democratic society has developed over the centuries. The programmes of study should have at the core the history of Britain, in particular its political, constitutional and cultural heritage. They should take account of Britain's evolution and its changing role as a European, Commonwealth and world power influencing and being influenced by ideas, movements and events elsewhere in the world. They should also recognise and develop an awareness of the impact of classical civilisations. Overall, they should help pupils to acquire and develop values based on objective analysis of evidence while remaining consistent with Sections 44 and 45 of the Education (No 2) Act 1986 which prohibits political indoctrination and requires balanced presentation of opposing views.

It's very interesting
to see
the evolution of
events
and people

This is
for logic
of events

5. Bearing in mind the general objectives described in paragraph 4 above, the programmes of study should give proper emphasis at each key stage to the content of historical knowledge and lay the foundation for the progressive development of the processes and skills of historical inquiry. They should foster: a sense of place and time and a grasp of chronology and historical terminology; an awareness of political, economic, social and other influences; and the capacity for historical understanding based on sound evidence. They should assist the progressive acquisition of skills in the collection, objective analysis, interpretation, discriminating use and reporting of evidence from a variety of sources. Above all, the programmes of study should seek to reveal to pupils that history is interesting, exciting and enjoyable, enabling teachers to draw imaginatively on a wide variety of teaching materials and historical sources, including appropriate local sources.

6. 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 history to the overall curriculum.

Special Needs

7. The Education Reform Act 1988 provides 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 that individual pupil. In addition, Orders or regulations under the 1988 Act can define the cases or circumstances in which the application of the national curriculum provisions may be modified or disapplied for any foundation subject. The Working Group should consider and advise on whether any such adaptations would be appropriate and justified in the case of history.

Links with other subjects

8. By its nature, history has links with many subjects across the curriculum. It both contributes to learning in other areas and is itself promoted by work in those fields. It helps in developing economic understanding, political and civic education, participation in a multi-ethnic society, European and wider awareness of the world, aesthetic and creative capacities, and personal and social education generally. It can benefit from knowledge and skills related to, for example, mathematics, information technology, statistics and economics. There are clear links, particularly with English and Welsh, science, geography and technology; with art, music and foreign languages and with areas such as classical studies. The Working Group should take these and any other reciprocal connections into account in its recommendations for attainment targets, programmes of study and related assessment arrangements for history, bearing in mind in particular that all subjects should promote the development of good written English and numeracy. Whilst there should be no presumption that history must be taught as a separate subject, the overriding consideration should be that clear attainment targets and programmes of study that ensure continuity and coherence in what is taught and learnt are set for history, however it is organised within the curriculum.

Ages and Stages; Time Allocations

9. The Working Group should assume that all pupils, other than those few whose statements of special educational need under the Education Act 1981 specify otherwise, will study history throughout their compulsory schooling and many are likely to take a GCSE in history or a subject which will involve a substantial element of history approved against relevant GCSE criteria.

10. In framing its recommendations the Working Group should assume that in England normally the equivalent of some 3-4 periods of a 40 period weekly timetable, or the equivalent of that in eg primary schools which do not organise a timetable in periods, will be available for history, during primary schooling and for years 1-3 of secondary school. Beyond that stage the amount of time required will depend upon whether a GCSE or equivalent examination course in history is being followed. Where it is, the Group should assume, for a pupil in years 4 and 5 of secondary school, on average 4 periods. For other courses, including non-examination courses, the Group should assume that on average 2 periods a week will be available for history, and that history may be studied as part of a wider course or on its own; but the essential requirement is that the history studied should provide for worthwhile progress beyond what has already been achieved at the end of key stage three.

Assessment

11. 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 steps. The targets, and the associated criteria for successive levels of attainment within them, should therefore be sufficiently clearly specified so that they are capable of assessment and each conveys a unique description of the required performance, regardless of the age at which it is reached.

12. 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 for assessment and testing announced by the Government on 7 June 1988 in response to the reports of the Task Group on Assessment and Testing which included recommendations for the work of subject groups. In particular the Working Group should offer advice in broad terms about assessment and testing in relation to the attainment targets recommended, the grouping of those targets for purposes of reporting the results of assessment, and in particular what might appropriately be measured by nationally prescribed tests.

GCSE

13. Not all pupils will take GCSE examinations in history as such. However, in defining attainment targets and programmes of study the Working Group should take account of the GCSE National Criteria for history and other subjects with a history element - including in particular classical studies - so far as these are consistent with the approach in the terms of reference. The School Examinations and Assessment Council will be asked to advise on whether, and if so how, the GCSE criteria need to be revised to reflect the national curriculum attainment targets and programmes of study for ages 14-16, and to approve syllabuses accordingly.

General Principles

14. 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

15. It will be important to bear in mind that the curriculum should provide equal opportunities for boys and girls. The Group should also take account of the ethnic diversity of the school population and society at large. Further guidance will be given on particular points to be considered in order to avoid unnecessary difficulties for children with special educational needs.

Wales

16. The Group will need to bear in mind that the Secretary of State for Wales wishes them to produce a framework of profile components, attainment targets and programmes of study which would be usable, with the necessary adaptation, in Wales. He has established a History Committee for Wales which is asked to take account of that framework in its work. Initially it is to produce advice, by 30 June 1989, giving outline recommendations for the content of Welsh history and its views on the extent to which Welsh perspectives should influence the wider study of history. For its final report, due by the end of March 1990, the Committee is asked to recommend a balanced overall curriculum for history in Wales, in the light of the final recommendations of the History Working Group. The History Working Group will need from the outset to liaise closely with the Committee on History for Wales. The Committee's final report is intended to form the basis of the Secretary of State for Wales' consultations and draft Orders.

Implementation

17. The Government intends to make orders under the 1988 Act requiring the core and foundation subjects to be taught from September 1989 to all pupils for a reasonable time in each of the first three key stages (i.e. ages 5-14): this will include history. Pupils who will then be in the fourth key stage (14-16) will already have made GCSE course choices, and the requirement will not therefore be extended to them until a later date, probably Autumn 1990 for those in the fourth year and Autumn 1991 for those in the fifth year.

18. No decisions have yet been taken on when attainment targets and programmes of study should be introduced for history: these will be influenced by the Working Group's advice.

PROPOSED MEMBERSHIP OF THE NATIONAL CURRICULUM HISTORY WORKING GROUP

Chairman: Cdr L M M Saunders Watson,
Vice-Chairman of the Heritage Education Trust
Former President of the Historic Houses Association

Members: Mr R M Guyver,
Wembury Primary School,
Plymouth,
Devon

Mrs C White,
Garth Hill Comprehensive School,
Bracknell,
Berkshire

TEMPORARILY RETAINED J. Gray 30/7/2016

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Mrs A Low-Beer,
University of Bristol

Dr A Prochaska,
Institute of Historical Research,
University of London

Mr J Hendy,
Chief Education Officer,
Stockport LEA,
Cheshire

Mr P Livsey,
Adviser on History and Geography
County Durham LEA

Mr H Hobhouse,
Author,
Castle Cary,
Somerset

Dr G Elwyn-Jones
University College, Swansea
(also member of Committee on History for Wales)



file

SRW

bc BG

10 DOWNING STREET
LONDON SW1A 2AA

From the Private Secretary

14 December 1988

Dear Tom,

**NATIONAL CURRICULUM:
MATHS AND SCIENCE**

The Prime Minister was grateful for your Secretary of State's minute of 9 December.

She is content for your Secretary of State to publish draft orders on the basis proposed.

I am copying this letter to Neil Thornton (Department of Trade and Industry), Clive Norris (Department of Employment), David Crawley (Scottish Office), Mike Maxwell (Northern Ireland Office) and Stephen Williams (Welsh Office).

Yours,

Paul

(PAUL GRAY)

Tom Jeffery, Esq.,
Department of Education and Science.

ECW

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PRIME MINISTER

TEACHER TRAINING AND HIGHER EDUCATION

Thank you for your personal minute of ^{11.00 PM} 28 November. The issues that you raise are of the greatest importance. As I explain below, a good deal is already being done about them.

Teacher Training

2. I share your concern about the quality of many initial teacher training courses and I have set in hand an examination of a number of ideas for improvement.

3. Let me begin with a quick resumé of what has been done so far. In 1984 Keith Joseph, who was as you know profoundly concerned about these matters, promulgated a set of national criteria by which all initial teacher training courses should be judged. Courses are subject to the approval of the holder of my office and Keith established a Council for the Accreditation of Teacher Education (CATE) under the chairmanship of Professor Taylor of Hull University to give advice on whether particular courses should be approved. Keith also arranged for all the initial teacher training courses to be inspected by HMI.

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4. These reforms have had some effect. Experienced classroom teachers are now far more influential in the design of the courses, in the selection of students to go on the courses and in the assessment of the performance of those students. Instruction is much less theoretical and much more closely related to classroom practice. And the academic content of the BEd courses has been greatly increased.

5. We are also getting a lot of help from industry. For example, BP has helped establish an experimental programme of on-the-job training for mature entrants in Hertfordshire. ICI are helping to run "taster courses" designed to attract mature candidates. We have in addition set up the Teaching As a Career Unit (TASC) with the job of mounting publicity campaigns to improve the image of teaching as a career and broaden the range of people who consider it.

6. In our search for suitable mature entrants, we have had discussions with the Ministry of Defence. As a result I hope that they will soon offer pre-retirement training to prepare suitable military personnel for a move across into teaching on leaving the Armed Forces.

7. I do not consider that these reforms go far enough for I am gravely concerned about the prospective shortage of teachers. I have therefore published proposals for a new and more flexible form of entry under which mature adults with experience of industry or other professions can be taken

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straight into the classroom as "licensed teachers". They then have to follow an in-service programme before becoming eligible for qualified teacher status on the recommendation of the employer - the local authority or the GM school or the CTC as the case may be.

8. I consider that this new route of entry into the profession is crucially important. My proposals have caused great apprehension among the unions and the teacher trainers who are worried that we might go back to a non-graduate profession. My proposals are out for consultation and I shall be reviewing these matters when I have the results.

9. Better publicity may also be part of the answer. I am considering the need for a new and bigger publicity campaign when demography really begins to bite on the supply of candidates. I certainly agree with you that we need to attract back into the profession trained teachers who are currently outside it. Re-entrants are now providing a very high proportion (about 55%) of all appointments to teaching posts. But there is still a large pool to be drawn on and I am considering what further steps could be taken to encourage more of these people to come back into teaching and to smooth the path for them. I shall let you have my further thoughts on all these issues when I have had time to reflect on the results of the consultations on the new form of entry into the profession.

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Higher Education Generally

10. The Universities Funding Council and the Polytechnics and Colleges Funding Council were inaugurated on 1 November. In my initial letters of guidance to the Councils I said that they must seek ways of encouraging institutions to increase their private earnings - which are already rising strongly. I have also asked the Councils to establish a systematic method of monitoring institutional performance and to develop further indicators of the quality and quantity of both teaching and research by institutions. I have therefore already made it clear to both the Funding Councils that they should allocate funds to the institutions of higher education in ways which - to quote your words - "strengthen rather than blunt incentives for attracting private funding and first-class teaching".

11. Work is in hand on the development of more radical policies. I am examining three possibilities:-

- i. A shift of public funding, so that institutions are less financed from recurrent grant and more through fees payable under the mandatory awards system.
- ii. A move by the institutions to charge higher fees than those paid through mandatory awards.
- iii. Replacing recurrent grant in whole or in part by vouchers given to the students.

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12. The first change would I believe be a useful step in the right direction. The objection to it has always been that it shifts money from a cash limited to a demand determined programme. Even so, I believe that Treasury Ministers may not be opposed to the idea because they can see, as I do, that it would be a useful way of encouraging institutions to think about earning their own living in the market place instead of demanding more recurrent grant from the centre. I intend to discuss this possibility with John Major. I will let you know the outcome.

13. Institutions are already free to charge higher fees to home students than those which are reimbursed through mandatory awards. But very few of them do so - and even those only do so for a few courses. The mood among Vice Chancellors has changed and it is entirely possible that both the universities and the polytechnics will become more entrepreneurial. I am impressed by the way in which Sir Ron Dearing and Mr Stubbs are encouraging the newly-autonomous polytechnics and colleges to challenge the received wisdom that has dominated our institutions of higher education for too long.

14. The proposal to replace recurrent grant by vouchers would be a very much more radical step. The implications and options are now being investigated by the team I have set up under Mr Richard Bird. As a first step I have already indicated my hope that we can separate the funding of teaching and research: this would allow any voucher regime to apply to teaching without affecting the funding of research. The

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design of a practical voucher system will not be easy. For example, it will have to take full account of the fact that, for example, medical courses cost twice as much as engineering courses which in turn cost twice as much as many arts courses. An equal value voucher could not possibly meet the full cost of training doctors.

15. If the money follows the student, some institutions may become too small to be viable. In the case of schools we are able to contemplate with equanimity the possibility that unpopular schools may have to close. As you know, I would not think it politically sensible to allow a university to close.

16. I am now examining these issues and the many others which arise in the consideration of vouchers. At our "value-for-money seminar", now arranged for 11 January, I shall be able to explain to you the objectives that I have set myself for 1989, but I would prefer to put to you some of these ideas which could be worked up before opening them to the wider consideration of colleagues.

K.B.

KB

12 DECEMBER 1988

DEPARTMENT OF EDUCATION AND SCIENCE

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EDUCATION

Policy 7201 2 XII



1116



Prime Minister
Brian Griffiths
thinks this is OK.

Yes not

Content?

Rec 6, 1/12

Units attached

Yes

PRIME MINISTER

NATIONAL CURRICULUM: MATHS AND SCIENCE

1. Following E(EP) discussion in July about the reports of the National Curriculum working groups for maths and science, our collective views were set out in the proposals sent to the National Curriculum Council (NCC). We wanted simplicity; fewer profile components; sharper statements of attainment; and the possibility of allowing some pupils aged 14-16 to follow a course occupying 12.5% of their time and leading to a single GCSE certificate, rather than a course taking 20% of their time and leading to a double GCSE award.

2. NCC have submitted their reports on maths and science to me and they were published early this week.

3. NCC have done a good job. They have successfully reconciled what we wanted with the sometimes conflicting views which emerged from consultation. Their recommendations for attainment targets and programmes of study meet all our concerns. As a result the National Curriculum for Maths and Science will be much more easily understood by parents, and will provide a better basis for testing achievement. I enclose copies of those parts of NCC's reports which set out their revised version of the attainment targets and programmes of study.

4. The only NCC recommendation which will be controversial is the endorsement of a single GCSE award option for 14-16 year olds. I think it is well justified. A single award option will allow flexibility at the 14-16 year old stage. Every pupil will now have to take some science up

to age 16, which will be a marked improvement on current practice. But the option will recognise that for some young people time is better spent developing a particular talent in say, modern languages or technology or music, than in doing a double GCSE science course.

5. E(EP) were clear that most pupils should do the double award option, both because of the need for a scientifically literate population and to ensure that as many pupils as possible keep open the option of studying science beyond 16. NCC have recommended that, in allowing a single award option, I should encourage all schools to offer the double award option and to ensure that the majority of their pupils follow it. I propose to accept that advice. I can make that clear when we publish draft Orders, which will go a considerable way towards allaying the concerns expressed on the single award option. Moreover, it is helpful that NCC have recommended a particular model for the single award which is intellectually demanding. It will not be an easy cop-out.

6. The next step is that draft Orders for attainment targets and programmes of study must be published. These are subject to a second round of consultations for a minimum of one month. Peter Walker and I propose that there should be common Orders for England and Wales. We propose to incorporate in the draft Orders the attainment targets and programmes of study recommended by NCC without any amendment.

7. The Act requires that we should publish reasons for any substantial departure from the NCC's recommendations. In this case, in accepting all the recommendations, we can avoid a source of controversy which would give rise to debate in the House when the Orders are laid under negative resolution procedure. We plan to publish the draft Orders immediately

before Christmas. This will give consultees up to 6 weeks (including Christmas and New Year) to come back to us by our deadline of 3 February. We must lay the final Orders by late February to give schools at least 6 months to prepare themselves before implementation begins in September 1989.

9. I should be grateful to have your agreement to proceed to publish draft Orders as proposed above. To keep to our schedule we need to know your response by 14 December.

10. Assessment and testing arrangements for science and mathematics will be the subject of separate Statutory Orders, for which there is no requirement to consult. I intend to lay assessment Orders in the Spring setting out the general requirement to assess: details of the tests will be added when these have been developed. The first round of assessment and testing will be in 1991 when the first cohort to be taught the new targets and programmes of study reaches the age of 7.

11. I am sending copies of this minute and its enclosures to David Young, Norman Fowler, Malcolm Rifkind and Tom King; and of the minute only to Peter Walker.

K.B.

KB

DEPARTMENT OF EDUCATION AND SCIENCE

9 DECEMBER 1988

NATIONAL CURRICULUM : MATHEMATICS AND SCIENCE

EXTRACT FROM NCC'S REPORTS

Notes

1. The attainment targets are specified at 10 levels on a single, continuous scale. Both the statements of attainment at the 10 levels and the general attainment targets will be included in the Statutory Orders.

2. Levels of attainment relate to age as follows

level 2	average 7 year old
level 4	average 11 year old
level 5/6	average 14 year old
level 6/7	average 16 year old

It is expected that at each of the 4 reporting ages pupils will be distributed across the levels. Thus bright 7 year olds could be at level 3; the brightest 16 year olds will be at level 10.

3. Minor editing of these draft extracts will be needed to put them into the right format for Statutory Orders. For example the non-statutory status of examples (as in the mathematics attainment targets) will need to be clarified.

4. It is important to appreciate that the statements of attainment as set out below do not in themselves constitute tests. They do provide the basis for constructing tests which will be designed to reveal whether or not children have reached particular levels of attainment.

ATTAINMENT TARGET 1: USING AND APPLYING MATHEMATICS

Using number, algebra and measures
in practical tasks and real-life problems

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	<p>Use materials provided for a practical task.</p> <p>Talk about own work and ask questions.</p> <p>Make predictions based on experience.</p>	<p>Add or remove everyday objects from a set.</p> <p>Find by comparison which is longer, taller, etc. and use appropriate language.</p> <p>Predict which will be the heavier of two objects and check using a balance.</p>
2	<p>Select materials and the mathematics to use for a practical task.</p> <p>Describe current work and check results.</p> <p>Ask and respond to the question 'What would happen if...?'</p>	<p>Use handspans, conkers etc. as measures; suggest things which are commonly measured in metres, miles, litres, pounds, seconds, minutes, hours, etc.</p> <p>Predict whether the contents of a tall cylinder will fill a cylinder of a different base.</p>
3	<p>Select the materials and the mathematics to use for a task. Estimate, check results, consider whether it is a sensible answer.</p> <p>Explain work being done and record findings systematically.</p> <p>Make and test predictions.</p>	<p>Make estimates based on familiar units, compare estimates and check by measurement, e.g. the height of a door in metres or the capacity of a bottle in litres.</p> <p>Organise an individual knock-out competition for the class and try it out.</p> <p>Explain number patterns and predict subsequent numbers where appropriate.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
4	Select the materials and the mathematics to use for a task; plan work methodically.	Organise a rota (with timings) for school lunches to avoid queuing.
	Record findings systematically and present them in oral, written or diagrammatic form as appropriate.	Understand the patterns in addition and multiplication tables, including symmetry of results and relationships between multiplication by 2, 4 and 8, etc.
	Use examples to test statements or definitions.	Generalise patterns using statements to define them: construct matchstick squares resulting in the sequence 4, 7, 10, 13...
5	Select the materials and the mathematics to use for a task; check there is sufficient information; work methodically and review progress.	Design a board game for four players.
	Interpret mathematical information presented in oral, written or diagrammatic form.	Follow simple sets of instructions in order to carry out a task such as planning a journey.
	Make and test simple statements.	The sum of two consecutive triangular numbers is a square number.

Level

Statements
of attainment

Example

6

Design a task and select appropriate mathematics and resources; check there is sufficient information and obtain any that is missing; use trial and improvement methods.

Use oral, written, visual or concrete forms to record and present findings.

Make and test generalisations and simple hypotheses; define and reason in simple contexts with some precision.

Design and make a device to measure accurately a given unit of time, e.g. two minutes.

Plot Cartesian co-ordinates to represent simple function mappings:
 $x = 2x + 3, y = 2x + 3.$

Determine the rule for a sequence and use the difference method to explore the pattern and check the generalisation.

7

Devise a mathematical task; work methodically within an agreed structure; use judgement in the use of given information; use trial and improvement methods; review progress.

Follow a chain of mathematical reasoning, spotting inconsistencies; follow new lines of investigation using alternative approaches.

Design a container to hold a litre of milk and set out instructions for mass production.

Explore more complex number patterns, generated by a computer

8

Devise a mathematical task and make a detailed plan of the work; work methodically checking information for completeness; consider whether the results are of the right order.

Make statements of conjecture using 'if...then'; define, reason, prove and disprove.

Decide where to put a telephone box in the locality.

Understand the role of a counter-example in the context of rules for sequences and in disproving hypotheses.

Level	Statements of attainment	Example
9	Design, plan and carry through a mathematical task to a successful conclusion.	Calculate lengths of arcs and areas of shapes which involve curved lines; calculate surface areas of cylinders, and volumes of cones and spheres.
	State whether a conjecture is true, false or not proven; define and reason; prove and disprove and use counter-examples; use symbolisation; recognise and use necessary and sufficient conditions.	Solve a range of linear inequalities: when is $3n + 4 < 17$?
10	Design, plan and carry through a mathematical task to a successful conclusion; present alternative solutions and justify selected route.	Investigate or design alternative network systems or routes between three or more towns, defining the criteria on which the solutions are based.
	Give definitions which are necessary, sufficient or minimal; define, reason, use symbolisation with confidence; construct a proof including proof by contradictions.	Use a calculator or computer to investigate whether a sequence given iteratively converges or diverges: $x_{n+1} = ((a/x_n) + x_n)/2$ for some value of a .

ATTAINMENT TARGET 2: NUMBER

Understand number and number notation

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	<p>Count, read, write and order numbers to at least 10, and know that the size of a set is given by the last number in the count.</p> <p>Understand the conservation of number.</p>	<p>Show that if a set of 8 pencils is counted twice in different orders, the answer should be the same.</p>
2	<p>Read, write and order numbers to at least 100 and use the knowledge that the tens-digit indicates the number of tens.</p> <p>Understand the meaning of 'a half', 'a quarter'.</p>	<p>Know (without counting in order) that $30 + 7$ is 37; 10 more than 42 is 52; and $3 \times 10p$ coins and $2 \times 2p$ coins give 34p.</p> <p>Find a quarter of a piece of string; know that half of 8 is 4.</p>
3	<p>Read, write and order numbers to at least 1000, and use the knowledge that the position of a digit indicates its value.</p> <p>Use decimal notation as the conventional way of recording in money.</p> <p>Appreciate the meaning of negative whole numbers.</p>	<p>Know that 'four hundred and two' is written 402 and why neither 42 nor 4002 is correct.</p> <p>Know that $3 \times £1$ coins plus $3 \times 2p$ coins is written as £3.06, and that 3.6 on a calculator means £3.60 in the context of money.</p> <p>Read a temperature scale; understand a negative output on a calculator.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
4	<p>Read, write and order whole numbers.</p> <p>Understand the effect of multiplying a whole number by 10 or 100.</p> <p>Understand and use decimal notation to two decimal places in the context of measurement.</p> <p>Recognise and understand simple everyday fractions.</p> <p>Recognise and understand everyday percentages.</p> <p>Understand and use the relationship between place values in whole numbers.</p>	<p>Explain why the cost of 10 objects costing £23 each is £230.</p> <p>Read scales marked in hundredths and numbered in tenths (1.89 m).</p> <p>Estimate $\frac{1}{4}$ of a length of a piece of wood or $\frac{1}{4}$ pint of milk (when baking).</p> <p>Examine attendance rates at school during a period of time.</p> <p>Know that 5000 is 5 thousands or 50 hundreds or 500 tens or 5000 ones.</p>
5	<p>Use index notation to express powers of whole numbers.</p> <p>Use unitary ratios.</p> <p>Read, write and order decimals, and appreciate the relationship between place values.</p>	<p>Know that $2^5 = 2 \times 2 \times 2 \times 2 \times 2$.</p> <p>Use a ratio of 1:50 for drawing a plan of the classroom.</p> <p>Explain that 0.23 is 2 tenths and 3 hundredths or 23 hundredths, or 2.3 tenths.</p>
6	<p>Understand and use equivalence of fractions and of ratios; relate these to decimals and percentages.</p>	<p>Know that $\frac{2}{5} = \frac{4}{10} = 0.4 = 40\%$.</p> <p>State that lengths 8 cm and 12 cm in a drawing are in the ratio 2:3.</p>
7	<p>Be able to express a positive integer as a product of primes.</p>	<p>Can find factors of a given number.</p> <p>Can find the HCF and LCM of two whole numbers.</p>

Level

Statements
of attainment

Example

8

Can express and use numbers in standard index form using positive and negative integer powers of 10.

Know that
 $1 \text{ million} = 10^6$
 $22731 = 2.2731 \times 10^4$
 $\frac{1}{1000} = 10^{-3}$.

Use index notation to represent powers and roots.

Use the x^y key on a calculator.

9

Distinguish between rational and irrational numbers.

Know that $\sqrt{2}$ and π are irrational. Know the significance of recurring and non-recurring decimals in this context.

ATTAINMENT TARGET 3: NUMBER

Understand number operations (addition, subtraction, multiplication and division) and make use of appropriate methods of calculation

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Add or subtract using objects, including coins, where the numbers involved are no greater than 10.	Add or remove everyday objects from a set.
2	Know and use addition and subtraction facts up to 10. Compare two numbers to find the difference. Solve whole number problems involving addition and subtraction, including money.	Expect that if 6 pencils are taken from a box of 10, there will be 4 left. Find how much is 7 greater than 3 by comparison. Work out the change from 20p when two biscuits are purchased costing 5p and 7p.
3	Know and use addition and subtraction number facts to 20 (including zero). Solve problems involving multiplication or division of whole numbers or money. Know and use multiplication facts up to 5×5 , and all those in 2, 5 and 10 multiplication tables.	State that the date of the next Friday after Friday 8 May must be 15 May. Find the cost of a class set of calculators at £2.45 each. Know that if tickets cost £4 each, only four can be bought with £18.

Level

*Statements
of attainment*

Example

4

Know multiplication facts up to 10×10 and use them in multiplication and division problems.

Add or subtract mentally two 2-digit numbers. Add mentally a column of single-digit numbers. Without a calculator add and subtract two 3-digit numbers. Multiply a 2-digit number by a single-digit number and divide a 2-digit number by a single-digit number, in both cases without a calculator.

Solve addition or subtraction problems using any numbers, and multiplication or division problems starting with whole numbers.

Calculate mentally that 9 hours of sleep every night is equivalent to 63 hours of sleep per week.

Work out without a calculator how much longer 834 mm is than 688 mm. Work out mentally how much heavier an object weighing 75 kg is than one weighing 48 kg.

Work out how many chocolate bars can be bought for £5 if each costs 19p, and how much change there will be.

5

Multiply a 3-digit number by a 2-digit number and divide a 3-digit number by a 2-digit number in both cases, without a calculator.

Calculate fractions and percentages of quantities using a calculator where necessary.

Mentally multiply and divide single-digit multiples of powers of 10 with whole number answers.

Calculate using negative numbers in a practical context.

Calculate
15% of £320;
 $\frac{1}{2}$ of 170 m;
37% of £234;
 $\frac{1}{10}$ of 2 m.

Calculate
 70×100 leading to
 $70 \times 500 = 35000$
 $800 \div 10$ leading to
 $800 \div 20 = 40$.

Calculate the increase in temperature from -4°C (4 degrees of frost) and $+10^{\circ}\text{C}$.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
6	<p>Work out fractional and percentage changes and related calculations.</p> <p>Calculate using ratios in a variety of situations.</p> <p>Convert fractions to decimals and percentages including finding one number as a percentage of another.</p>	<p>Work out the cost of a computer which is offered at 15% discount in a sale.</p> <p>Adapt a recipe for 6 people to one for 8 people; enlarge a design in the ratio 2:3.</p> <p>Find the percentage profit for a profit of £3 on an investment of £189.</p>
7	<p>Mentally multiply and divide single digit multiples of any power of 10, and realise that with a number less than 1, multiplication has a decreasing effect and division has an increasing effect.</p> <p>Solve multiplication and division problems involving numbers of any size.</p> <p>Use the memory and bracket facility of a calculator to plan a calculation and evaluate expressions.</p>	<p>Work out mentally 80×0.2 and $600 \div 0.2$.</p> <p>Use a calculator to convert inches to centimetres given that there are 0.394 inches to the centimetre.</p> <p>Differentiate correctly between</p> $\frac{7.2}{9.8 + 12.7}$ <p>and</p> $\frac{7.2}{9.8} + 12.7$
8	<p>Calculate with numbers in standard form (with positive and negative powers of 10).</p> <p>Substitute negative numbers into formulae involving addition, subtraction, multiplication and division.</p> <p>Calculate with fractions.</p>	<p>Calculate</p> $\frac{(3.2 \times 10^3) + (2.7 \times 10^3)}{(3.2 \times 10^3) - (4.6 \times 10^3)}$ <p>Work out $s = ut + \frac{1}{2} at^2$ where t and a take negative values.</p> <p>Divide a 3 m strip of wood into two parts in the ratio 5:7.</p>

ATTAINMENT TARGET 4: NUMBER

Estimate and approximate in number

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Give a reasonable estimate of a number of objects (up to 10).	Estimate the number of apples in a bowl.
2	Make a reasonable estimate of a number of objects up to 20.	Estimate the number of building bricks needed to fill a box.
3	Recognise that the first digit is the most important in indicating the size of a number, and approximate to the nearest 10 or 100. Understand 'remainders' given the context of calculation, and know whether to round up or down.	Know that 37 is roughly 40. Know that if taxis carry 4 people each, 5 taxis are needed for 18 people and one has only 2 people.
4	Make use of estimation and approximations to check the validity of addition and subtraction calculations. Be aware of aspects of calculator rounding errors.	Estimate that $1472 - 383$ is about 1100. Realise that $7 + 3 \times 3 = 6.9999999$ may occur on a calculator.
5	Use and refine 'trial and improvement' methods.	Find the edge of a cube whose volume is 100 cm^3 in the following way: $4^3 = 64$; $5^3 = 125$ so the side is more than 4 cm, but less than 5 cm. As $4.5^3 = 91.125$, the side is greater than 4.5 cm etc.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
6	<p>Can approximate using a specified number of significant figures or decimal places.</p> <p>Make use of estimations and approximations to check that the results of multiplication and division problems involving whole numbers are of the right order.</p>	<p>Read a calculator display, approximating to 3 significant figures.</p> <p>Know that $278 \div 39$ is about 7.</p>
7	Nothing new at this level.	
8	Make use of estimations and approximations to check that the results of calculations are of the right order.	Recognise that $\frac{0.25 \times 83.4}{5.7}$ is about 3 or 4.
9	<p>Be aware of the upper and lower bounds of numbers expressed to a given degree of accuracy.</p> <p>Calculate the upper and lower bounds in the addition, subtraction, multiplication and division of two numbers expressed to a given degree of accuracy.</p>	<p>Know the difference between 4.60 and 4.6 measurements; realise that a number written as 9.7 correct to one decimal place, can actually lie anywhere between 9.65 or 9.75 and be 9.65 or 9.75 depending on conventions.</p> <p>Realise that if 12.5 and 3.7 are expressed to one decimal place, then $12.5 + 3.7$ lies between $12.45 + 3.65$, and $12.55 + 3.75$. Also that</p> <p>$\frac{12.5}{3.7}$ lies between $\frac{12.45}{3.75}$ and $\frac{12.55}{3.65}$.</p>

Level

Statements
of attainment

Example

10

Calculate the upper and lower bounds in calculations involving a variety of numbers expressed to a given degree of accuracy.

Know that $\frac{6.3 \times 2.8}{0.7}$ lies

between $\frac{6.25 \times 2.75}{0.75}$

and $\frac{6.35 \times 2.85}{0.65}$

ATTAINMENT TARGET 5: NUMBER/ALGEBRA

Recognise and use patterns, relationships and sequences, and make generalisations

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Copy, continue and devise repeating patterns involving one-digit numbers represented by objects/apparatus and one-digit numbers.	Continue a threading bead pattern: red, red, blue, red, red, blue, ... Continue the pattern 21212121...
2	Explore and use the patterns in addition and subtraction facts to 10. Distinguish between odd and even numbers.	Use coins to make various combinations to the value of 5p. $5 + 0 = 5 \quad 5 = 4 + 1$ $4 + 1 = 5 \quad = 3 + 2$ $3 + 2 = 5 \quad = 3 + 1 + 1$ $2 + 3 = 5 \quad = 2 + 2 + 1 \text{ etc.}$ $1 + 4 = 5$
3	Explain number patterns and predict subsequent numbers where appropriate. Find number patterns and equivalent forms of 2-digit numbers and use these to perform mental calculations. Recognise whole numbers which are divisible by 2, 5 and 10.	Continue: 5, 10, 15, 20, ... Continue: $4 + 10 = 14$, $14 + 10 = 24$, $24 + 10 = 34$, ... $27 + 31 = 20 + 7 + 30 + 1$ $= 50 + 8$ $= 58.$

Level

*Statements
of attainment*

Example

4 Apply strategies such as doubling and halving, to explore properties of fractions, including equivalence of fractions.

Generalise patterns which arise in various situations.

Recognise that $\frac{2}{3} = \frac{4}{6} = \frac{1}{\frac{3}{2}} = \dots$

Understand the patterns in addition and multiplication tables, including symmetry of results and relationships between multiplication by 2, 4 and 8 etc.

Multiplication table:

x	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16

Construct matchstick squares, using an appropriate number of matchsticks to make 1,2,3,4,... squares.

5 Understand and use terms such as prime, square root, cube, multiples and factors.

Recognise patterns in numbers through spatial arrangements.

Follow simple sets of instructions to generate sequences, and be able to predict the next few numbers in a given sequence.

Estimate whether there are more prime numbers between 0 and 50 than between 50 and 100 and check whether the estimate is correct.

Square and triangular numbers.

Continue sequences:
1,4,9,...
1,2,4,7,11,...

Understand the program:
10 FOR NUMBER = 1 TO 10
20 PRINT NUMBER*NUMBER
30 NEXT NUMBER.

6 Determine the rule for generating a sequence and use the difference method systematically in exploring the pattern of a sequence.

Explore number patterns using spreadsheets or other computer facilities.

Continue the pattern:
2 5 10 17 26 ...
3 5 7 9 ...
2 2 2 ...

Level	Statements of attainment	Example
7	Use symbolic notation to express the rules of sequences (mainly linear and quadratic).	Express in symbols the rules for the following sequences: $1, 3, 5, \dots, 2n + 1, \dots$ $1, 4, 9, \dots, n^2, \dots$ $\frac{1}{2}, \frac{2}{3}, \dots, \frac{n}{n+1}, \dots$
	Understand the meaning of reciprocals and explore relationships.	Use the facts that $\frac{1}{2}$ is the reciprocal of 2. $\frac{a}{b}$ is the reciprocal of $\frac{b}{a}$.
	Explore more complex number patterns, generated by a computer.	Continue 1, 3, 2, 2.5, ... (the next number is the average of the two preceding numbers).
8	Understand the relationships between powers and roots.	Know that the fourth root of 81 is 3.
	Understand the role of a counter-example in the context of rules for sequences and in disproving hypotheses.	Check whether the pattern 2, 4, 8, ... continues by doubling when finding the number of regions created by joining points on the circumference of a circle and accept eventually that it does not.
9	Calculate growth and decay rates.	Know about rates of economic growth and decline, and the half-life of radioactive elements.
10	Use a calculator or computer to investigate whether a sequence given iteratively converges or diverges.	$x_{n+1} = ((a/x_n) + x_n)/2$, for some value of a .

ATTAINMENT TARGET 6: ALGEBRA

Recognise and use functions, formulae, equations and inequalities

Level	Statements of attainment	Example
1	Nothing specific at this level.	
2	Understand the use of a symbol to stand for an unknown number.	Know \square stands for a number in the statement $3 + \square = 10$ and solve it.
3	Deal with inputs to, and outputs from, simple function machines.	<p>INPUT (machine) OUTPUT</p> <p>3 \longrightarrow 5</p> <p>7 \longrightarrow 9</p> <p>4 \longrightarrow 6</p> <p>Describe what is happening to the left-hand numbers to get the numbers on the right-hand side. (What is the function?)</p> <p>Use doubling, halving, LOGO commands, addition as the inverse of subtraction, etc.</p>
4	Understand and use simple formulae, or equations expressed in words.	<p>Recognise the relationship (function) between the corresponding members in the sets: $\{2,3,10\} \rightarrow \{21,31,101\}$ (i.e. multiply a number by 10 and add 1).</p> <p>Solve an equation such as, 'if I double a number, then add 1 and the result is 49, what was the number?'</p>
	Recognise that \times and $+$ are inverse operations and use this to check calculations.	

Level	Statements of attainment	Example
5	<p>Understand and use simple formulae or equations expressed in symbolic form.</p> <p>Express a simple function symbolically.</p>	<p>Use the fact that perimeter p is given by $p = 2(a + b)$ for a rectangle.</p> <p>Know that $a \times b$ is written as ab.</p> <p>If cakes cost 15p then write $c = 15 \times n$ (or $15n$) where c pence is the total cost and n is the number of cakes.</p>
6	Solve linear and simple polynomial equations by trial and improvement methods.	Solve equations such as $x^2 = 5$ and $x^3 = 20$ using a calculator.
7	<p>Use the rules of indices for positive integer values.</p> <p>Solve simple inequalities on a number line.</p> <p>Solve a wider range of polynomial equations by trial and improvement methods.</p> <p>Solve simultaneous linear equations.</p>	<p>Simplify expressions such as: $2x^2 + 3x^2$, $2x^2 \times 3x^3$, $(3x^2)^3$, and $4a(3a + 2b)$.</p> <p>List the values of n where n is a whole number such that $-10 < 2n \leq 20$.</p> <p>Solve $x^2 + x = 5$,</p> <p>$x^3 + x = 20$ by such a method.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
8	<p>Manipulate simple algebraic expressions.</p> <p>Use the rules of indices for negative and fractional values.</p> <p>Understand and use a wider range of formulae and functions.</p>	<p>Find common factors such as $a^2x + ax^2 = ax(a + x)$.</p> <p>Transform formulae such as $V = IR, v = u + at$.</p> <p>Multiply out two brackets $(ax + b)(cx + d)$.</p> <p>Use $x^0 = 1$,</p> $y^{-3} = \frac{1}{y^3}, \quad \frac{x^2}{x^3} = \frac{1}{x} = x^{-1}$ <p>Use the formula $T = 2\pi\sqrt{\frac{l}{g}}$ to calculate one variable given the other.</p>
9	<p>Express general laws in symbolic form.</p> <p>Solve a wider range of linear inequalities.</p>	<p>Work with direct proportion, inverse proportion and inverse square law.</p> <p>Solve $3n + 4 < 17$.</p>
10	<p>Manipulate a range of algebraic expressions as needed in a variety of contexts.</p>	<p>Rearrange $x^2 + 3x - 2 = 0$ to give the iterative formula.</p> $x_{n+1} = \frac{2}{(x_n + 3)}$ <p>Simplify</p> $\frac{1}{x+2} + \frac{1}{x-3}$ <p>Show that</p> $x^2 - 6x + 10 = (x - 3)^2 + 1 \geq 1.$

ATTAINMENT TARGET 7: ALGEBRA

Use graphical representation of algebraic function

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1-3	Nothing specific at these levels, but see other targets for relevant activities.	
4	Know the conventions of the coordinate representation of points; work with coordinates in the first quadrant.	<p>Plot points; draw diagrams.</p> <p>Create shapes by use of DRAW and MOVE commands in the appropriate graphics mode, or using LOGO.</p> <p>Draw graphs as required by other targets.</p>
5	Work with coordinates in all four quadrants.	
6	Use and plot Cartesian coordinates to represent simple function mappings.	$x \rightarrow x + 1, y = x + 1;$ $x \rightarrow x^2, y = x^2.$
7	<p>Know the form of graphs of linear functions.</p> <p>Generate various types of graphs on a computer or calculator and interpret them (type, intersections, slope).</p> <p>Use graphical methods to solve simultaneous linear equations.</p>	
8	<p>Know the form of graphs of quadratic and reciprocal functions and select appropriate scales.</p> <p>Use straight-line graphs to locate regions given by linear inequalities.</p>	$x < 10, y > 6, y < 2x + 3.$

Level

Statements
of attainment

Example

9

Interpret and use m and c
in $y = mx + c$ in a variety of
contexts.

Solve equations using graphical
methods.

Use the graph of $y = x^2 + 5x$
to solve $x^2 + 5x = 7$.

Use the graphs of $y = x^2 + 5x$ and
 $y = x^2$ to solve
 $x^2 = x^2 + 5x$.

10

Construct tangents to graphs to
determine the gradient.

Find the approximate area under
a graph and interpret the result.

Sketch the graph of functions
 $y = f(x-a)$, $y = f(kx)$, $y = f(x) + a$ from the
graph of $y = f(x)$ for different values of a
and k .

Find velocity in distance/time
graphs, and acceleration in
velocity/time graphs.

Understand and use the fact
that the area under a
velocity/time graph gives the
distance.

ATTAINMENT TARGET 8: MEASURES

Estimate and measure quantities, and appreciate the approximate nature of measurement

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Compare objects without measuring, and use appropriate language.	Use language such as: long, longer than, longest; tall, taller than, tallest; heavy, light; before, after; hot, cold.
2	Use non-standard measures, in length, capacity, weight and time to compare objects and recognise the need to use standard units. Appreciate the use of coins up to 20p. Know the most commonly used units in length, capacity, weight and time, and what they are used for.	Use handspans, conkers, etc. as measures. Handling money: shopping activities in the classroom. Suggest things which are commonly measured in metres, miles, litres, pints, pounds, seconds, minutes, hours etc.
3	Use a wider range of metric units. Choose and use appropriate units and instruments in a variety of situations, interpreting numbers on a range of measuring instruments. Make estimates based on familiar units.	Use centimetre, kilometre, gram. Use an appropriate tape/ruler to compare lengths that cannot be put side by side (such as 1 m 43 cm). Read digital and analogue clocks correctly. Read a speedometer on a car or bicycle correctly. Estimate the height of a door in metres, or the capacity of a bottle in litres; a period of time.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
4	<p>Understand the relationship between units.</p> <p>Understand the notion of scale in maps and drawings.</p> <p>Find areas by counting squares, and volumes by counting cubes, using whole numbers.</p>	<p>Use two units such as millilitres and litres to measure the capacity of the same jug.</p> <p>Draw a plan of a classroom on a scale of 1 cm to 1 m.</p> <p>Estimate the area of a leaf; work out the approximate volume of a small box.</p> <p>Approximate time taken to complete a task.</p>
5	<p>Make sensible estimates related to everyday objects.</p> <p>Be able to use imperial units still in daily use, and know their rough metric equivalents.</p> <p>Convert from one metric unit to another.</p>	<p>Estimate the length of a car, the capacity of a teacup, the weight of a school bag.</p> <p>Use of timetables to estimate time of arrival.</p> <p>Recall that 1 kg is about 2 lb, 8 km is approximately 5 miles, 1 litre is about 1.75 pints.</p> <p>Work out that 2.4 kg is equivalent to 2400 g.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
6	<p>Understand and use compound measures.</p> <p>Recognise that measurement is approximate and choose the degree of accuracy appropriate for a particular purpose.</p>	<p>Work out an average speed, or the density an object.</p>
7	<p>Recognise that a measurement expressed to a given unit is in possible error of half a unit.</p> <p>Distinguish between the formulae for perimeter, area and volume by considering dimensions.</p>	<p>Recognise that nd is a linear measurement and that πr^2 is an area measurement.</p> <p>Identify from a range of formulae which denote (say) volume</p> $- 4\pi r^2, \frac{4\pi r^2}{3}, \frac{\pi r^2 h}{3}$ <p>and $r(\pi + 2)$.</p>
8	<p>Use knowledge and skills in length, area and volume to carry out required calculations in plane and solid shapes.</p>	<p>Perform calculations using rectangles, triangles, parallelograms, trapezia, cubes, cuboids, cylinders, prisms and solids of constant cross-sectional area.</p>
9	<p>Calculate lengths of arcs and areas of shapes which involve curved lines; calculate surface areas of cylinders, and volumes of cones and spheres.</p>	

Level

*Statements
of attainment*

Example

10

Determine the possible effects of errors on calculations which involve measurements.

Know that calculating the weight of 100 objects, given the weight of only one of them, magnifies the possible error.

--Given the length and breadth of a rectangle calculate the range within which the area lies.

ATTAINMENT TARGET 9: USING AND APPLYING MATHEMATICS

Using shape and space and handling data in practical tasks and real-life problems

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	<p>Use materials provided for a practical task.</p> <p>Talk about own work and ask questions.</p> <p>Make predictions based on experience.</p>	<p>Build 3-D solid shapes and draw 2-D shapes and talk about them. Make various constructions from a range of materials.</p> <p>Create simple mapping diagrams e.g. link children's names to pets owned, read and interpret them.</p>
2	<p>Select materials and the mathematics to use for a practical task.</p> <p>Describe current work and check results.</p> <p>Ask and respond to the question 'What would happen if...?'</p>	<p>Choose criteria to sort and classify objects; record results of observations or outcomes of events e.g. identify those children who walk to school and those who come by bus or car.</p> <p>Make use of a block graph to indicate means of transport to school: discuss and draw conclusions.</p>
3	<p>Select the materials and the mathematics to use for a task. Estimate, check results, consider whether it is a sensible answer.</p> <p>Explain work being done and record findings systematically.</p> <p>Make and test predictions.</p>	<p>Construct and interpret bar charts; create and interpret graphs where the symbol represents a group of units.</p> <p>Describe and record wind direction from a weather vane.</p> <p>Distinguish between 'fair' and 'unfair': know that a die with wrong spots such as two 'ones' and no 'six' has bias.</p>

Level

Statements
of attainment

Example

4

Select the materials and the mathematics to use for a task; plan work methodically.

Create a decision tree diagram with questions to sort and identify a collection of objects.

Record findings systematically and present them in oral, written or diagrammatic form as appropriate.

Make a plan of the classroom, selecting an appropriate scale; consider alternative arrangements of furniture and work areas.

Use examples to test statements or definitions.

Construct simple 2-D and 3-D shapes from given information and know associated language: triangles, rectangles, circles, cubes, pyramids and prisms.

5

Select the materials and the mathematics to use for a task; check there is sufficient information; work methodically and review progress.

Use networks to solve problems e.g. find the shortest route for a postman's journey.

Interpret mathematical information presented in oral, written or diagrammatic form.

Design and use an observation sheet to collect data; collate and analyse results e.g. devise a simple habitat recorder for an ecological survey.

Make and test simple statements.

Predict the probability that the next car passing the school would be a British car and test by carrying out a traffic survey.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
6	<p>Design a task and select appropriate mathematics and resources; check there is sufficient information and obtain any that is missing; use trial and improvement methods.</p> <p>Use oral, written, visual or concrete forms to record and present findings.</p> <p>Make and test generalisations and simple hypotheses; define and reason in simple contexts with some precision.</p>	<p>Determine the best location for a pedestrian crossing; collect data at an accident black spot.</p> <p>Design and use a questionnaire to survey opinion (taking account of bias); collate and analyse results, e.g. a survey of taste in poetry, music, literature, art, television programmes, etc.</p> <p>Test the hypothesis that there is a relationship between the height and weight of a pupil and create a scatter graph to test this statement.</p>
7	<p>Devise a mathematical task; work methodically within an agreed structure; use judgement in the use of given information; use trial and improvement methods; review progress.</p> <p>Follow a chain of mathematical reasoning, spotting inconsistencies; follow new lines of investigation using alternative approaches.</p>	<p>Estimate the probability of a drawing pin landing on its base by experimentation.</p> <p>Test the hypothesis that pupils and/or parents would prefer the school day to start at 0800 hours and finish at 1400 hours without a lunch break.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
8	<p>Devise a mathematical task and make a detailed plan of the work; work methodically checking information for completeness; consider whether the results are of the right order.</p> <p>Make statements of conjecture using 'if...then'; define, reason, prove and disprove.</p>	<p>Design a garden to meet given needs, e.g. greenhouse, play space, screening.</p> <p>Construct a tree-diagram or use a tabulation to define all the possible outcomes of 3 events where each event has 2 outcomes - such as tossing a coin.</p>
9	<p>Design, plan and carry through a mathematical task to a successful conclusion.</p> <p>State whether a conjecture is true, false or not proven; define and reason; prove and disprove and use counter-examples; use symbolisation; recognise and use necessary and sufficient conditions.</p>	<p>Design a car park layout to maximise the number of spaces in a given area.</p> <p>Present a set of complex data in a simplified form, using a variety of diagrams and graphs, e.g. prepare a table from a government report or opinion poll for publication in the popular press.</p>
10	<p>Design, plan and carry through a mathematical task to a successful conclusion; present alternative solutions and justify selected route.</p> <p>Give definitions which are necessary, sufficient or minimal; define, reason, use symbolisation with confidence; construct a proof including proof by contradiction.</p>	<p>Work in a group using critical path diagrams in preparing for a social event or a business venture.</p> <p>Use matrices to transform vectors, represent points in 2-D and 3-D space and use matrix algebra to define transformations.</p>

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ATTAINMENT TARGET 10: SHAPE AND SPACE


Recognise and use the properties of two-dimensional and three-dimensional shapes

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Examine 3-D shapes, sort and classify.	Use of a collection of containers of all shapes and sizes and natural shapes.
	Build 3-D solid shapes and draw 2-D shapes and talk about them.	Make various constructions from a range of materials.
2	Recognise squares, rectangles, circles, triangles, cubes, rectangular boxes (cuboids), spheres, and be able to talk about them.	Create pictures and patterns using 2-D shapes or abstracting from 3-D objects.
		Select from a collection of 3-D objects those which have at least one flat surface.
3	Sort shapes (2-D and 3-D) in different ways and give reasons for each method of sorting.	Sort shapes with a square corner, shapes with curved edges, shapes with equal sides or faces.
4	Understand and use language associated with angle.	Know acute, obtuse, reflex and right-angles, parallel, perpendicular, vertical and horizontal, etc.
	Construct simple 2-D and 3-D shapes from given information and know associated language.	Construct triangles, rectangles, circles, nets for cubes, pyramids and prisms.
5	Understand congruence of simple shapes.	Group together congruent shapes from a range of shapes.
	Explain and use angle properties associated with intersecting and parallel lines and triangles, and know associated language.	Identify equal angles in a diagram.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
6	<p>Know and use angle properties and symmetry properties of quadrilaterals and polygons.</p> <p>Recognise and use common 2-D representation of 3-D objects.</p> <p>Use computers to generate and transform 2-D shapes.</p> <p>Classify and define types of quadrilaterals.</p>	<p>Determine whether a tessellation of given shapes is possible.</p> <p>Use isometric paper in 2-D to represent 3-D.</p> <p>Read simple plans and elevations.</p> <p>Use LOGO to draw regular polygons.</p>
7	<p>Understand and apply Pythagoras' Theorem.</p>	<p>Calculate a side of a right-angled triangle when the other two sides are known.</p>
8	<p>In two dimensions, use sine, cosine, tangent for right-angled triangles.</p>	
9	<p>Calculate distances and angles in solids using plane sections and trigonometric ratios.</p> <p>Use sine, cosine and tangent for obtuse-angled triangles.</p>	<p>Find the angle that the edge of a square-based pyramid makes with its base.</p> <p>Understand the conditions for congruent triangles.</p> <p>Find different solids that have the same number of faces, vertices and edges.</p>
10	<p>Know and use angle properties of circles.</p> <p>Sketch the graphs of sine and cosine functions for all angles.</p> <p>Use sine and cosine rules to solve problems in 2-D and 3-D contexts.</p>	

ATTAINMENT TARGET 11: SHAPE AND SPACE

Recognise location and use transformations
in the study of space

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	<p>State a position using prepositions such as: on, inside, above, under, behind, next to, etc.</p> <p>Give and understand instructions for moving along a line.</p> <p>Appreciate spatial properties through moving shapes around.</p>	<p>Follow directions in a PE lesson.</p> <p>Using a variety of apparatus and templates.</p>
2	<p>Give and understand instructions for turning through right-angles.</p> <p>Recognise different types of movement: straight movement (translation); turning movement (rotation); flip movement (reflection).</p>	<p>Rotate body through 1,2,3,4 right-angles.</p> <p>Turn to left or right on instruction (PE games or LOGO).</p> <div style="text-align: center;">  </div>
3	<p>Recognise reflective symmetry including an axis of symmetry in 2-D and a plane of symmetry in 3-D.</p> <p>Understand eight points of the compass; use clockwise and anti-clockwise appropriately.</p> <p>Identify the symmetries of various shapes.</p>	<p>Study 2-D shapes and identify lines of symmetry; discover planes of symmetry of the cube.</p> <p>Describe wind direction from a weather vane.</p> <p>Find the axes of symmetry in a square, an equilateral triangle, a semi-circle, circle, etc.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
4	Specify location by means of coordinates (in first quadrant) and by means of angle and distance. Recognise rotational symmetry.	Locate features on an ordnance survey map, given their grid references; use of LOGO. Turn shapes using tracing paper.
5	Use networks to solve problems. Specify location by means of coordinates in the four quadrants.	Find the shortest route for a postman's journey. Plot the vertices of a triangle (3,2), (-1,5), (-2,-6).
6	Understand and use bearings to define direction. Reflect a simple figure in mirror lines in different positions. Enlarge a shape by a whole number scale factor. Determine with the aid of a computer a rule that will give rise to a desired path or shape.	Use bearings as a practical application: a ship's or aircraft's bearing or location of a buoy.
7	Determine the locus of an object moving subject to a rule. Enlarge a shape by a fractional scale factor.	Find the locus of points equidistant from two fixed points. Find the locus of points whose sum of distances from two fixed points is constant. Predict relative movements of parts in a linked cog or pulley system.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
8	Understand and use mathematical similarity; know that angles remain unchanged and corresponding sides are in the same ratio.	Calculate the effect of enlargement on linear dimensions.
	Understand and use vector notation.	Locate a point as a position vector; describe a tessellation in terms of a vector; interpret by a scalar multiplication of a vector.
	Know how to locate position in 3-D coordinates (x, y, z).	Use trigonometric techniques in simple 3-D contexts.
9	Understand and use the relationship between the surface areas of similar figures; and also for volumes of similar 3-D solids.	
	Understand laws of addition and subtraction of vectors.	Understand application to resultant forces and velocities.
10	Understand how transformations are related by combinations and inverses.	Find inverses of transformations considered earlier.
	Use of matrices to transform vectors, represent points in 2-D and 3-D space.	
	Use matrix algebra to define transformations.	

ATTAINMENT TARGET 12: HANDLING DATA

Collect, record and process data

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Select criteria for sorting a set of objects and apply consistently.	
2	<p>Choose criteria to sort and classify objects; record results of observations or outcomes of events.</p> <p>Help to design a data collection sheet and use it to record a set of data leading to a frequency table.</p>	<p>Identify those children who walk to school and those who come by bus or car.</p> <p>Record the number and type of birds visiting the bird table.</p> <pre> Blackbird XX 2 Sparrow XXXXX 5 Robin X 1 Blue Tit XXX 3 </pre>
3	<p>Extract specific pieces of information from tables and lists.</p> <p>Enter and access information in a simple database.</p>	<p>Locate a statistic from a table, the cost of an item in a catalogue, etc.</p> <p>Handle weather statistics or personal data, such as height, date of birth, age, etc.</p>
4	<p>Specify an issue for which data is needed. Collect, group and order discrete data using tallying methods with suitable equal class intervals and create a frequency table for grouped data.</p> <p>Understand, calculate and use the mean and range of a set of data.</p> <p>Interrogate data in a computer database.</p>	<p>Study the age distribution of a group: find and record the ages in the class or school.</p> <p>Calculate the means to compare the scoring records of two hockey teams which have played different numbers of games.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
5	<p>Design and use an observation sheet to collect data; collate and analyse results.</p> <p>Collect, group and order continuous data using equal class intervals with some awareness of boundary problems, and create a frequency table for grouped data and represent in a block graph.</p> <p>Insert and interrogate data in a computer database, and draw conclusions.</p>	<p>Devise a simple habitat recorder for an ecological survey;</p> <p>Conduct a survey of cars passing with one, two, three,...occupants.</p> <p>Collect information about height from children in a year group.</p> <p>Handle data arising through experiments or measurements in science, geography and CDT and from published sources in other areas of the curriculum.</p> <p>Draw conclusions about the effect of an epidemic from census data.</p>
6	<p>Specify an issue for which data is needed; design and use an appropriate observation sheet to collect data; collate and analyse results.</p> <p>Design and use a questionnaire to survey opinion (taking account of bias); collate and analyse results.</p>	<p>Determine the best location for a pedestrian crossing. Collect data at an accident blackspot.</p> <p>Conduct a survey of taste in poetry, music, literature, art, television programmes, etc.</p>

Level

Statements
of attainment

Example

7

Specify a simple hypothesis; design and use an appropriate questionnaire to test it (only yes/no responses required); collect and analyse the results to see whether the hypothesis is valid.

Using relevant data, record and organise grouped data into class intervals suitably defined; produce a frequency table; calculate the mean (using a calculator).

Test the hypothesis that pupils/parents would prefer the school day to start at 0800 hours and finish at 1400 hours without a lunch break.

Prepare tables; calculate the mean.

(a) Measurement of heights.

Use 10cm intervals from 120 – 200 cm: class intervals defined as:

Interval	Mid Interval Point
120 – 130 cm	125 cm
130 – 140 cm	135 cm
140 – 150 cm	145 cm, etc.

(b) Examination marks: Range 0 – 100, intervals of 10 marks:

0 – 9	mid point	4.5
10 – 19	mid point	14.5
20 – 29	mid point	24.5
30 – 39	mid point	34.5

Find, make and interpret statements about frequency distributions: mean, median, mode, and range.

8

Design and use an appropriate questionnaire with three or more possible responses to each question: collate and analyse the results to test an hypothesis.

Construct a cumulative frequency table.

List a given set of products in order of preference.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
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9	Study a population by sampling and appreciate the reliability of different sizes of samples.	
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10	Describe range of variables through different measures of dispersion: calculate standard deviation of a set of data.	
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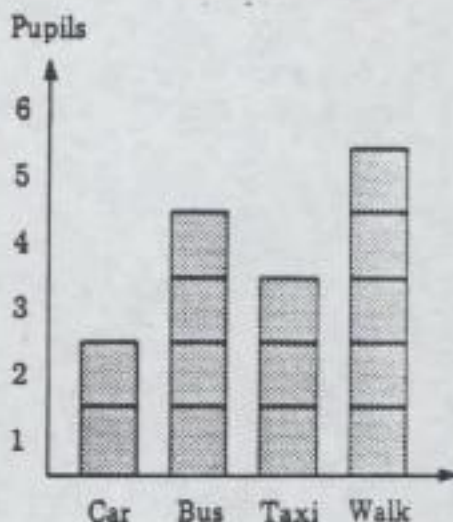
ATTAINMENT TARGET 13: HANDLING DATA

Represent and interpret data

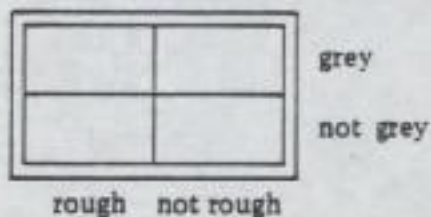
<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	<p>Record directly with real objects or drawings, and comment about the result.</p> <p>Create simple mapping diagrams showing relationships; read and interpret them.</p>	<p>Draw a simple picture to represent 'Children at our table'.</p> <p>Link children's names to pets owned.</p>

- 2 Construct, read and interpret block graphs and frequency tables.

Make use of a block graph to indicate means of transport to school; and draw conclusions.



Use diagrams to represent the result of classifying using two different criteria.

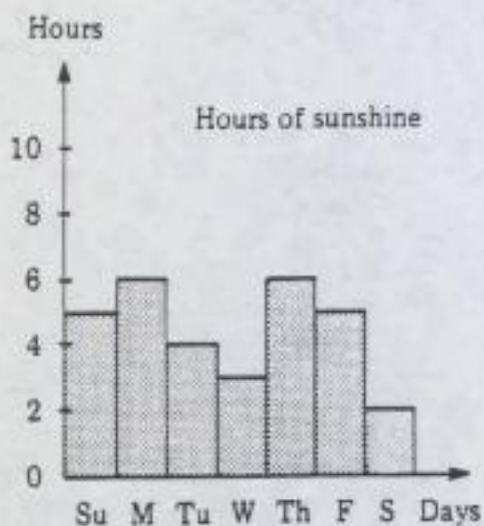


[Carroll Diagram]

Level *Statements
of attainment*

Example

3 Construct and interpret bar charts.



Create and interpret graphs where
the symbol represents a group of
units.

Number of raffle tickets
sold by each class

□ = 20 [= less than 20

class A □ □ □ [

class B □ □ □

class C □ □ □ □

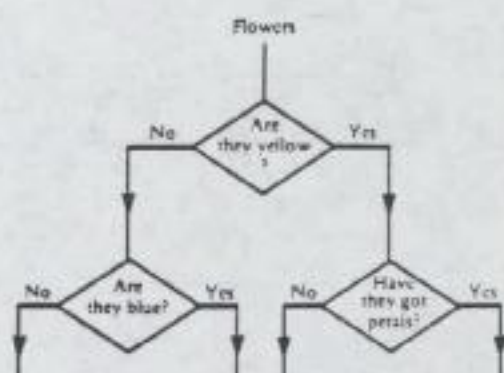
class D □ □ □ □ [

Level

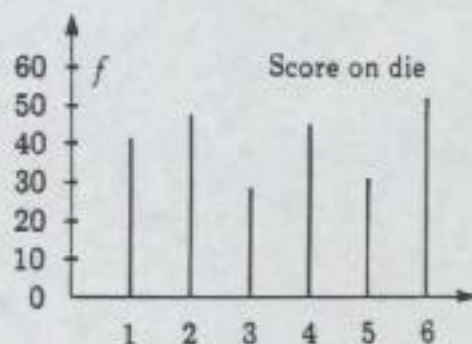
Statements
of attainment

Example

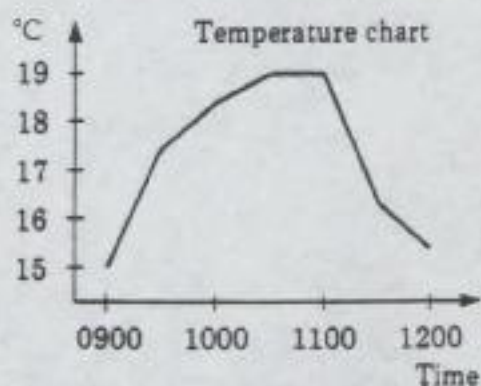
- 4 Create a decision tree-diagram with questions to sort and identify a collection of objects.



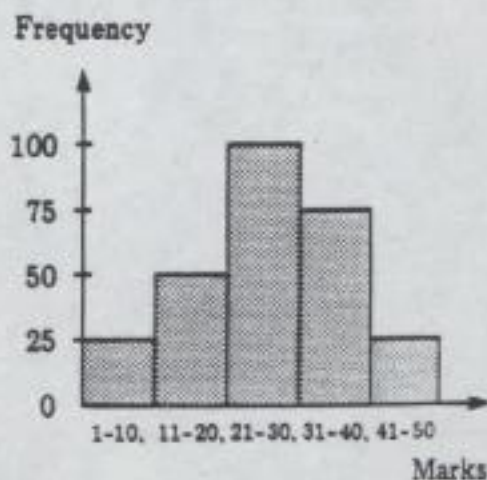
Construct, read and interpret a bar-line graph for a discrete variable (where the length of the bar-line represents the frequency).



Construct and interpret a line graph and know that the intermediate values may not have a meaning.



Construct and interpret a frequency diagram choosing suitable class intervals covering the range for a discrete variable.



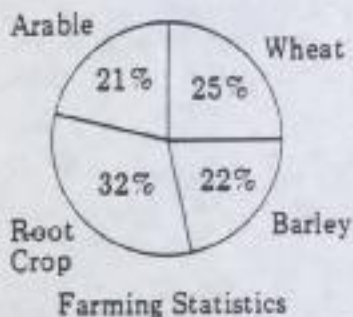
Level

Statements
of attainment

Example

5

Construct and interpret a pie chart from a collection of data with a few variables; interpret pie charts already presented in journals or newspapers.

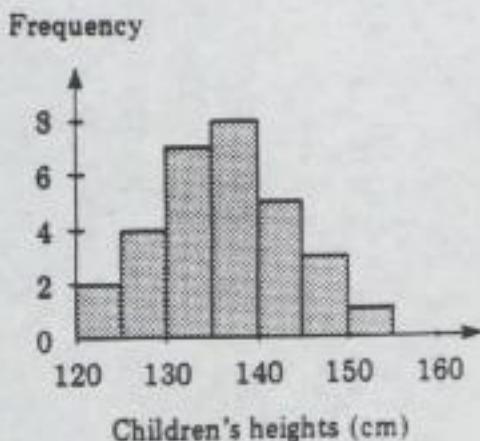


Construct and interpret conversion graphs.

Devise and use conversion graphs for different currencies, and for converting thermometer readings from Fahrenheit to Celsius.

Class intervals	Frequency
120-125	2
125-130	4
130-135	7
135-140	8
140-145	5
145-150	3
150-155	1

Construct, and interpret a frequency diagram choosing suitable class intervals covering the range for a continuous variable.

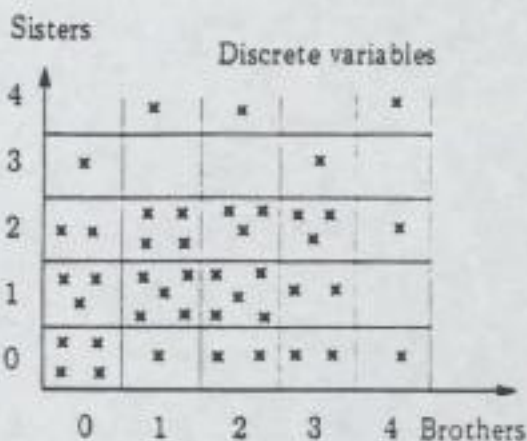


Level

Statements
of attainment

Example

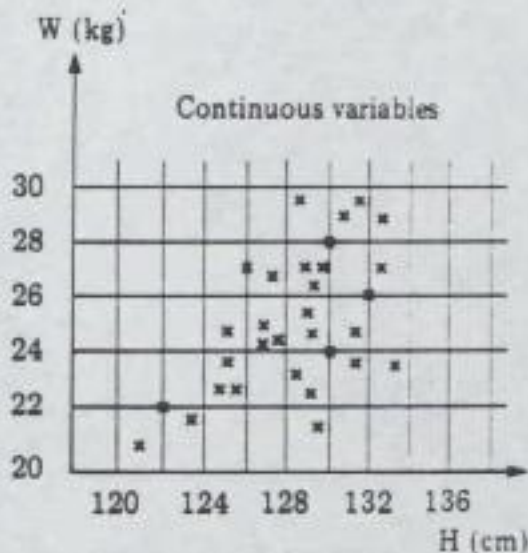
Create scatter graphs for discrete variables.



Plotting number of brothers and number of sisters for each child

6

Create scatter graphs for continuous variables and have a basic understanding of correlation.



Plotting height (cm) and weight (Kg) of each child

Construct, describe and interpret information through two-way tables.

Record the orders from 10 people for various alternatives in a restaurant.

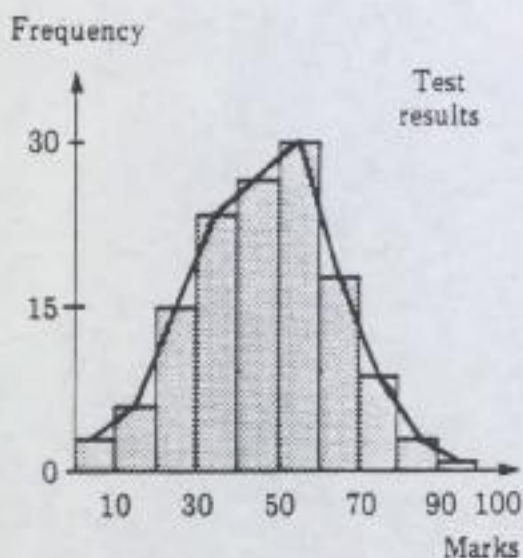
Construct and interpret network diagrams which represent relationships or connections.

Use network diagrams to represent railway/airline connections between a number of major cities.

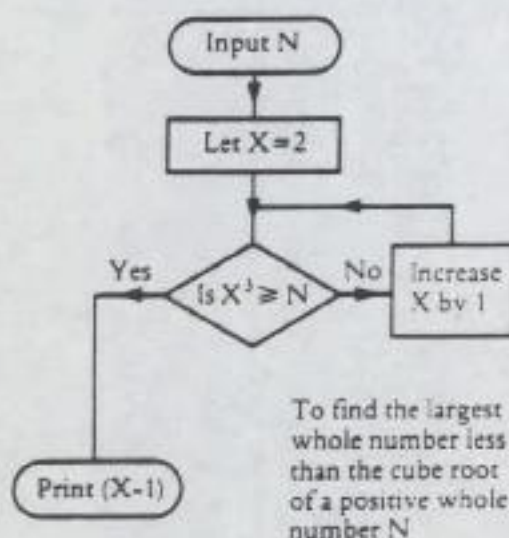
Level **Statements of attainment**

- 7 Draw a frequency polygon as a line graph from a frequency distribution for grouped data. Make comparisons between two frequency distributions by superimposing one frequency polygon on top of the other frequency polygon.

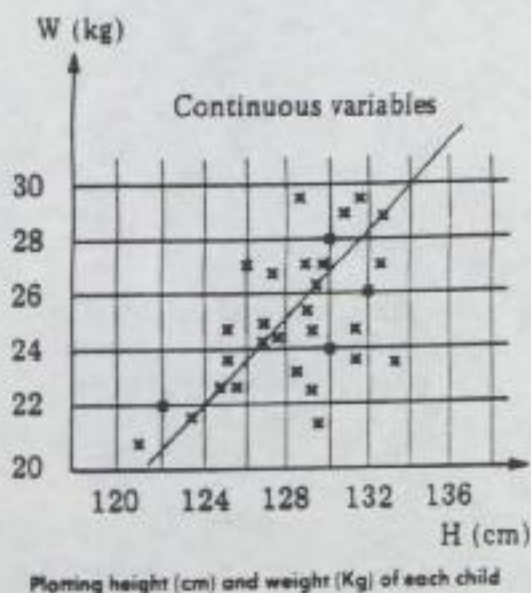
Example



Construct and interpret flow diagrams with and without loops.



Construct a line of 'best fit' by inspection on a scatter diagram.



Level

Statements
of attainment

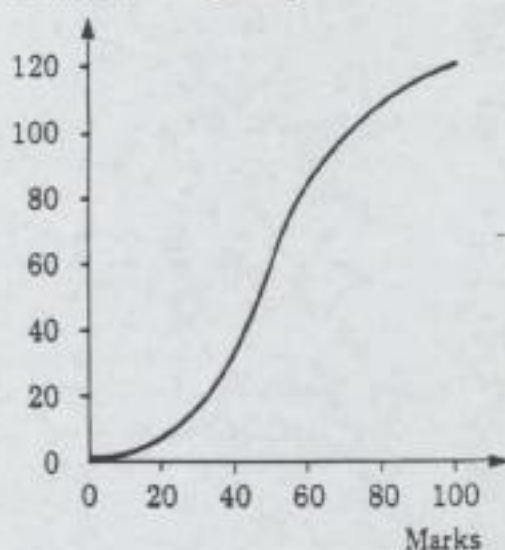
Example

8

Construct and interpret a cumulative frequency curve using the upper boundary of the class interval.

Identify the interquartile range.

Cumulative Frequency



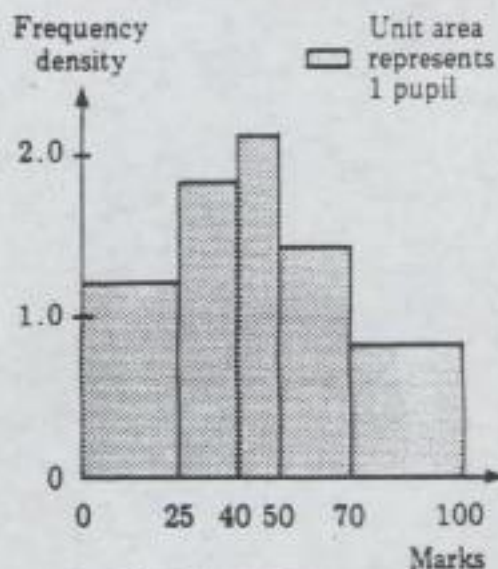
9

Present a set of complex data in a simplified form, using a variety of diagrams and graphs, and computer statistical packages.

Construct and interpret a histogram with understanding of the connection between area and frequency.

Make a table from a government report or an opinion poll and prepare it for publication in the popular press.

Distribution of marks in an exam



10

Interpret various types of diagrams including critical path diagrams and linear programming.

Consideration of different shapes of histograms representing distributions with special reference to mean and dispersion, including the *normal* distribution.

Use critical path diagrams in preparing for a social event, or a business venture.

ATTAINMENT TARGET 14: HANDLING DATA

Understand, estimate and calculate probabilities

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
1	Recognise possible outcomes of simple random events.	Realise that: the new baby will be a boy or girl; tomorrow will be either wet or dry.
2	Recognise that there is a degree of uncertainty about the outcome of some events and other events are certain or impossible.	<p>Recognise that it is:</p> <p>Certain that 'it will get dark tonight';</p> <p>Impossible that 'I will be 20 tomorrow';</p> <p>Uncertain whether 'it will rain tomorrow'.</p>
3	Can place events in order of 'likelihood' and use appropriate words to identify the chance.	<p>Can decide for each of these statements if they are: 'very likely', 'likely', 'unlikely' or 'very unlikely':</p> <p>'I will go to school on time tomorrow';</p> <p>'I shall be a millionaire someday';</p> <p>'My favourite television star will visit my school';</p> <p>'I will support the school team tonight'.</p>
	Understand and use the idea of 'evens' and say whether events are more or less likely than this.	<p>Recognise that if a fair coin is tossed then there is equal chance of a head or tail.</p> <p>Recognise that if a die is thrown there is equal chance of an odd or even number but the chance of getting a particular number (say 5), is less than an even chance.</p>
	Distinguish between 'fair' and 'unfair'.	<p>Know that a die with wrong spots such as two 'ones' and no 'six', has bias.</p>

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
4	Understand and use the probability scale from 0 to 1.	Know that if a bag contains blue marbles, then the probability of selecting a red marble from the bag is 0 and the probability of selecting a blue marble is 1.
	Give and justify subjective estimates of probabilities in a range of events.	
	List all the possible outcomes of an event.	Recognise that when a 'fair' coin is tossed the probability of heads is 1 out of 2 or $\frac{1}{2}$. Appreciate and list the different ways of scoring a total of 7 when throwing 2 dice.
5	Appreciate randomness and know that, when repeating the same experiment, different outcomes result.	Know that you do not always get 5 heads in 10 tosses of a coin and that very occasionally there will be none.
	Distinguish between estimates of probabilities based on statistical evidence and those based on the assumptions of symmetry.	Know that if the names of the 5 most common makes of car are put into a bag, the probability of picking a particular make of car is $\frac{1}{5}$.
	Know that if each of n events is assumed to be equally likely the probability of one occurring is $\frac{1}{n}$.	Know that a sound estimate of the probability that the next car passing the school would be a British car could be made by first doing a traffic survey.

6 Identify all the outcomes when dealing with 2 combined events which are independent using diagrammatic, tabular or other forms.

Know that if there are several possible outcomes of an event (exhaustive and mutually exclusive) that the total of these probabilities is 1 and, in particular, that the probability of something happening is 1 minus the probability of it not happening.

List all the outcomes when tossing 2 coins: HH, TT, TH, HT.

List all the outcomes when throwing 2 dice and show the total sums arising.

Recognise that if the probability of a machine failing is 0.05 then the probability of it not failing is 0.95.

Know what the probability is of drawing a green ball from a bag of 50 balls of 4 different colours (5 green, 15 blue, 20 yellow and 10 red).

7 Understand and use relative frequency as an estimate of probability.

When assigning probabilities appreciate that relative frequency and equally likely considerations may not be appropriate and 'subjective' estimates of probability have to be made.

Understand and apply the addition of probabilities for mutually exclusive events.

Know that when a die is rolled many times each number will appear on approximately $\frac{1}{6}$ of the total number of throws and expect that if the die is fair, then the proportion will generally approximate to $\frac{1}{6}$ as the number of throws is increased.

Estimate the probability of a drawing pin landing on its base by experimentation

Recognise that a statement that there is a 0.1 probability that a cure for cancer will be found in the next 2 years cannot be based on evidence.

<i>Level</i>	<i>Statements of attainment</i>	<i>Example</i>
8	Understand that when dealing with 2 independent events, the probability of them both happening is less than the probability of either of them happening (unless the probability is 0 or 1). Calculate the probability of a combined event given the probability of 2 independent events and illustrate combined probabilities of several events using tabulation or tree-diagrams.	<p>Know that the probability of getting 2 consecutive sunny days over a weekend is less than the probability of getting a sunny Saturday or Sunday.</p> <p>Given that there are 2 sets of traffic lights on the way to school and the probabilities of getting straight through the lights without having to stop are 0.6 and 0.4 respectively, find the probability of a cyclist having to stop at one set of lights, using a tree-diagram or otherwise.</p> <p>Draw a tree-diagram, or use a tabulation to define all of the possible outcomes of 3 events, where each event has 2 outcomes - such as tossing a coin 3 times.</p>
9	Produce a tree-diagram to illustrate the combined probability of several events, when these are not independent.	An operation has a 60% success rate the first time it is attempted but if it is unsuccessful it can be repeated, but with a success rate of only 30%. The probability of success the third time is so low that surgeons are unwilling to operate. What is the the probability that the operation will fail twice?
10	Understand and apply conditional probabilities to an event. Understand and apply the probability rule for any two events, i.e. probability of event (A or B).	

6. RECOMMENDATIONS FOR PROGRAMMES OF STUDY FOR INCLUSION IN STATUTORY ORDERS FOR MATHEMATICS IN THE NATIONAL CURRICULUM

- 6.1 Programmes of study are the essential content which needs to be covered to enable pupils to reach or surpass the attainment targets and give guidance as to how attainment targets should be achieved. They are the basis on which teachers will develop schemes of work to implement the curriculum in mathematics.
- 6.2 The work which a teacher designs for a class of pupils will consist of a set of varied activities designed to help pupils to achieve the next levels in attainment targets. The activities will involve pupils in 'chalk and talk' with teachers, as well as in individual and group work, involving pencil and paper, practical work and private study. These activities will be sparked off by the full range of stimuli deployed in the good classroom, not least by pupil initiative. They will involve work in and beyond the classroom designed to improve knowledge and skills.
- 6.3 Teachers who are planning work for their classes need to be able to draw upon published resources, and to take advantage of opportunities provided by the environment of the school, and by work in other subjects. They also need to make sure that the contexts of activities are interesting and relevant to the appropriate age group. They need to bear in mind that not all pupils will become mathematicians. Pupils aged 11 and 16 may be motivated in different ways, even though they may be working at the same level on the same attainment target.
- 6.4 The selection of activities chosen by a teacher for a particular group of pupils will, therefore, vary from school to school, from class to class, and from pupil to pupil. The overall design and balance of any plan of work should, however, be based upon the following guidelines:
 - (a) activities should bring together different areas of mathematics;
 - (b) the order of activities should be flexible;
 - (c) activities should be balanced between tasks which develop knowledge, skills and understanding and those which develop the ability to tackle practical problems;
 - (d) activities should be balanced between the applications of mathematics and ideas which are purely mathematical;
 - (e) activities should be balanced between those which are short in duration and those which have scope for development over an extended period;
 - (f) activities should, where appropriate, use pupils' own interests or questions either as starting-points or as further lines of development;

- (g) activities should, where appropriate, involve both independent and cooperative work;
 - (h) tasks should include those which have an exact result or answer and those which have many possible outcomes;
 - (i) activities should be balanced between different modes of learning: doing, observing, talking and listening, discussing with teachers and other pupils, reflecting, drafting, reading and writing;
 - (j) activities should encourage pupils to use mental arithmetic and pencil-and-paper methods, and to become confident in the use of a range of mathematical tools and new technology.
- 6.5 The programmes of study have been amended to include using and applying mathematics at each level (see para. 3.15 above).
- 6.6 Council will be publishing non-statutory guidance on the development of programmes of study and schemes of work, based on chapter 8 of the proposals, to assist the implementation of the draft Orders.
- 6.7 *Council recommends the following programmes of study for levels of attainment 1-10 for inclusion in the draft statutory Orders for mathematics in the National Curriculum.*

PROGRAMMES OF STUDY

Level 1

Using and applying mathematics

Using materials for a practical task.
Talking about own work and asking questions.
Making predictions based on experience.

Number

Counting, reading, writing and ordering numbers to at least 10.
Understanding conservation of number.
Using addition and subtraction with numbers no greater than 10.
Reasonable estimation of a number of objects up to 10.

Algebra

Copying, continuing and devising repeating patterns.

Measures

Comparing objects without measuring; using appropriate language.

Shape and space

Sorting and classifying 3-D shapes.
Building 3-D solid shapes and drawing 2-D shapes and talking about them.
Giving and understanding instructions for movement along a line.
Appreciating spatial properties through moving shapes.

Handling data

Selecting criteria for sorting a set of objects, and applying them consistently.
Recording with objects or drawing.
Creating simple mapping diagrams showing relationships and interpreting them.
Recognising possible outcomes of random events.

PROGRAMMES OF STUDY

Level 2

Using and applying mathematics

Selecting materials and the mathematics to use for a practical task.
Describing work and checking results.
Asking and responding to the question 'What would happen if...?'

Number

Reading, writing and ordering numbers to at least 100 and using the knowledge that the tens digit indicates the number of tens.
Understanding the meaning of 'half' and 'quarter'.
Knowing and using addition and subtraction facts up to 10.
Comparing two numbers to find the difference.
Solving whole number problems involving addition and subtraction including money.
Making a reasonable estimate of a number of objects up to 20.

Algebra

Exploring and using patterns in addition and subtraction facts to 10.
Distinguishing odd and even numbers.
Understanding the use of a symbol to stand for an unknown number.

Measures

Using non-standard measures in length, capacity, weight and time, comparing objects and recognising the need for standard units.
Appreciating the use of coins up to 20p.
Knowing commonly used units in length, capacity, weight and time.

Shape and space

Recognising squares, rectangles, circles, triangles, cubes, cuboids and spheres and talking about them.
Understanding turning through right-angles.
Recognising types of movement: straight (translation), turning (rotation) and flip (reflection).

Handling data

Choosing criteria to sort and classify objects; recording results or outcomes of events.
Designing a data collection sheet, recording data leading to a frequency table.
Constructing and interpreting frequency tables and block graphs.
Using diagrams to represent the result of classification using two different criteria.
Recognising a degree of uncertainty about the outcomes of some events and that other events are certain or impossible.

PROGRAMMES OF STUDY

Level 3

Using and applying mathematics

Selecting materials and the mathematics to use for a task.
Estimating, checking results, considering whether it is a sensible answer.
Explaining work and recording findings systematically.
Making and testing predictions.

Number

Reading, writing and ordering numbers to at least 1000, and using the knowledge that the position of a digit indicates its value.
Using decimal notation in recording money.
Appreciating the meaning of negative whole numbers in practical contexts, e.g. a temperature scale.
Knowing and using addition and subtraction facts to 20, (including zero).
Solving problems involving multiplication or division of whole numbers or money.
Knowing and using multiplication facts up to 5×5 and all those in 2, 5 and 10 multiplication tables.
Understanding remainders and knowing whether to round up or down.
Recognising the first digit is the most important in indicating the size of a number and approximating to the nearest 10 or 100.

Algebra

Finding number patterns and equivalent forms of 2-digit numbers and using these to perform mental calculations.
Explaining number patterns and predicting subsequent numbers.
Recognising whole numbers divisible by 2, 5 and 10.
Dealing with inputs and outputs from simple function machines.

Measures

Using a wider range of metric units.
Choosing and using appropriate units and instruments; interpreting numbers on a range of measuring instruments.
Making estimates based on familiar units.

Shape and space

Sorting 2-D and 3-D shapes and giving reasons.
Recognising reflective symmetry including an axis of symmetry in 2-D and a plane of symmetry in 3-D.
Using and understanding compass bearings and clockwise and anti-clockwise.
Identifying the symmetries of various shapes.

Handling data

Extracting information from tables and lists.
Entering and accessing information in a simple database.
Constructing and interpreting bar charts and graphs where the symbol represents a group of units.
Placing events in order of 'likelihood' and using appropriate words to identify the chance.
Understanding and using the idea of 'evens'.
Distinguishing 'fair' and 'unfair' and recognising bias.

PROGRAMMES OF STUDY

Level 4

Using and applying mathematics

Selecting materials and mathematics to use for a task and planning work methodically.
Recording findings systematically and presenting them in oral, written or diagrammatic form.
Using examples to test statements or definitions.

Number

Reading, writing and ordering whole numbers.
Understanding and using the effect of multiplying whole numbers by 10 or 100.
Understanding and using decimal notation to two decimal places in the context of measurement.
Understanding and using relationship between place values in whole numbers.
Recognising and understanding simple fractions.
Recognising and understanding everyday percentages.
Knowing multiplication facts up to 10×10 and using them in multiplication and division problems.
Mental addition and subtraction of two 2-digit numbers.
Mental addition of a column of single-digit numbers.
Adding and subtracting two 3-digit numbers without a calculator.
Multiplying and dividing 2-digit numbers by a single-digit number without a calculator.
Estimating and approximating to check the validity of addition and subtraction calculations.
Being aware of calculator rounding errors.
Solving addition and subtraction problems using any numbers, and multiplication and division problems starting with whole numbers.

Algebra

Exploring properties of fractions including equivalence.
Generalising patterns, e.g. symmetry of results.
Understanding and using simple formulae or equations expressed in words.
Recognising multiplication and division are inverse operations and using to check calculations.
Knowing the conventions of the coordinate representation of points; work with coordinates in the first quadrant.

Measures

Understanding the relationship between units.
Understanding scale in maps and drawings.
Finding areas using squares, and volumes using cubes.

Shape and space

Understanding and using language associated with angles.
Constructing 2-D and 3-D shapes from given information.
Specifying location by means of coordinates in first quadrant and by means of angle and distance.
Recognising rotational symmetry.

Handling data

Specifying an issue for which data is needed.

Collecting and grouping discrete data, using frequency tables and block graphs with suitable equal class intervals.

Understanding calculating and using mean and range of a set of data.

Interrogating data in a computer base.

Constructing and interpreting bar-line and line graphs and frequency diagrams with suitable class intervals for discrete variables.

Understanding and using probability scale from 0 to 1.

Listing all the possible outcomes of an event.

PROGRAMMES OF STUDY

Level 5

Using and applying mathematics

Selecting materials and mathematics to use for a task, checking there is sufficient information, working methodically and reviewing progress.
Interpreting mathematical information presented in oral, written or diagrammatic form.
Making and testing simple statements.

Number

Using index notation to express powers of whole numbers.
Using unitary ratio such as 1:50.
Reading, writing and ordering decimals and appreciating place values.
Multiplying a 3-digit number by a 2-digit number and dividing a 3-digit number by a 2-digit number, in both cases without a calculator.
Calculating fractions and percentages of quantities.
Mentally multiplying and dividing single-digit multiples of powers of 10.
Calculating with negative numbers in a practical context.
Using 'trial and improvement' methods and refining.

Algebra

Understanding and using terms such as prime, square root, multiple and factor.
Generating and predicting in a given number sequence.
Recognising patterns in numbers through spatial arrangements.
Understanding and using simple formulae or equations expressed in symbolic form.
Expressing simple functions symbolically.
Working with coordinates in all four quadrants.

Measures

Making estimates related to everyday objects.
Using imperial units still in use and knowing their rough metric equivalents.
Converting one metric unit to another.

Space and shape

Understanding congruence of simple shapes.
Using properties associated with intersecting and parallel lines and triangles and knowing associated language.
Using networks to solve problems.
Specifying location by means of coordinates in four quadrants.

Handling data

Designing and using an observation sheet to collect data; collating and analysing results.

Collecting and grouping continuous data, creating frequency tables and representing in block graphs with awareness of boundary problems.

Inserting and interrogating data in a computer database and drawing conclusions.

Constructing and interpreting pie charts from a collection of data with a few variables.

Constructing and interpreting conversion graphs.

Constructing and interpreting frequency diagrams, and choosing class intervals for a continuous variable.

Creating scatter graphs for discrete variables.

Appreciating randomness.

Distinguishing between estimates of probabilities based on statistical evidence and those based on assumptions of symmetry.

Knowing that if each of n events is assumed to be equally likely, the probability of one occurring is $1/n$.

PROGRAMMES OF STUDY

Level 6

Using and applying mathematics

Designing a task and selecting mathematics and resources; checking information and obtaining any that is missing; using trial and improvement methods. Presenting findings using oral, written, visual or concrete forms. Making and testing generalisations and simple hypotheses; defining and reasoning with some precision.

Number

Understanding and using equivalence of fractions and ratios. Working out fractional and percentage changes. Calculating using ratios in a variety of situations. Converting fractions to decimals and percentages. Using estimation and approximation to check answers to multiplication and division problems are of the right order.

Algebra

Determining rules for generating sequences and using different methods to explore pattern. Exploring number patterns using spreadsheets or other computer facilities. Solving linear and simple polynomial equations by trial and improvement methods. Using and plotting Cartesian coordinates to represent simple function mappings.

Measures

Understanding and using compound measures, e.g. speed, density. Recognising that measurement is approximate and choosing degree of accuracy required for measurement.

Shape and space

Classifying and defining types of quadrilaterals. Using angle and symmetry properties of quadrilaterals and polygons. Using 2-D representation of 3-D objects. Using computers to generate and transform 2-D shapes. Understanding and using bearings to define direction. Determining the traversability of networks. Reflecting a figure in mirror lines in different positions. Enlarging a shape by a whole number scale factor. Determining, with the aid of a computer, a rule that will give rise to a desired path or shape.

Handling data

Designing and using observation sheets; collating and analysing results. Surveying opinions taking account of bias, using a questionnaire. Creating scatter graphs for continuous variables. Constructing and interpreting information through two-way tables and network diagrams. Identifying outcomes of two combined events which are independent. Knowing that the total sum of the probabilities of mutually exclusive events is 1 and that the probability of something happening is 1 minus the probability of it not happening.

PROGRAMMES OF STUDY

Level 7

Using and applying mathematics

Devising a mathematical task; working methodically with an agreed structure; using judgement, trial and improvement methods and reviewing progress.
Following a chain of mathematical reasoning, spotting inconsistencies; following new lines of investigation using alternative methods to overcome difficulties.

Number

Expressing positive integers as a product of primes.
Mentally multiplying and dividing single-digit multiples of any power of 10.
Solving problems using multiplication and division with numbers of any size.
Using memory and bracket facility of a calculator to plan a calculation and evaluate expressions.

Algebra

Using symbolic notation to express the rules of sequences.
Understanding the meaning of reciprocals and exploring relationships.
Exploring complex number patterns generated by a computer.
Using the rules of indices for positive integer values.
Solving simple inequalities on a number line.
Solving a wider range of polynomial equations by trial and improvement methods.
Solving simultaneous linear equations.
Knowing the form of graph of linear functions and using graphical methods to solve simultaneous linear equations.
Generating various types of graphs on a computer or calculator and interpret them.

Measures

Recognising degrees of error in measurement.
Distinguishing between formulae for perimeter, area and volume by considering dimensions.

Shape and space

Understanding and applying Pythagoras' Theorem.
Determining locus of an object moving subject to a rule.
Enlarging a shape by a fractional scale factor.

Handling data

Specifying and testing a simple hypothesis.

Using and recording relevant grouped data, into class intervals suitably defined; producing a frequency table; calculating the mean using a calculator.

Finding, making and interpreting statements about frequency distribution: mean, median, mode and range.

Drawing a frequency polygon as a line graph from a frequency distribution for grouped data.

Constructing and interpreting flow diagrams with and without loops.

Constructing a line of 'best fit' by inspection on a scatter diagram.

Understanding and using relative frequency as an estimate of probability.

When assigning probabilities appreciating that relative frequency and equally likely considerations may not be appropriate and 'subjective' estimates of probability have to be made.

Understanding and applying the addition of probabilities for mutually exclusive events.

PROGRAMMES OF STUDY

Level 8

Using and applying mathematics

Devising a mathematical task and making a detailed plan of the work; working methodically; checking information; considering whether results are of the right order.

Making statements of conjecture using 'if...then'; defining, reasoning, proving and disproving.

Number

Using index notations to represent powers and roots.

Expressing and using numbers in standard index form, with positive and negative powers of 10.

Substituting negative numbers into formulae.

Calculating with fractions.

Estimating and approximating to check that the results of calculations are of the right order.

Algebra

Understanding the role of counter-example in the context of rules for sequences and in disproving hypotheses.

Understanding the relationships between powers and roots.

Using rules of indices for negative and fractional values.

Using a wider range of formulae and functions.

Manipulating simple algebraic expressions.

Knowing the graphs of quadratic and reciprocal functions.

Using straight line graphs to locate regions given by linear inequalities.

Measures

Using knowledge and skills in length, area and volume to carry out calculations in plane and solid shapes.

Shape and space

In two dimensions, using sine, cosine and tangent for right-angled triangles.

Understanding and using mathematical similarity.

Understanding and using vector notation.

Knowing how to locate position in 3-D coordinates.

Handling data

Designing and using questionnaire with multiple responses, collate and analyse results to test an hypothesis.

Constructing a cumulative frequency table.

Constructing and interpreting a cumulative frequency curve using the upper boundary of the class interval, and identifying the

inter-quartile range.

Understanding that when dealing with two independent events, the probability of them both happening is less than the probability of either of them happening (unless the probability is 0 or 1). Calculating the probability of a combined event given the probability of two independent events and illustrating combined probabilities of several events using tabulation or tree-diagrams.

PROGRAMMES OF STUDY

Level 9

Using and applying mathematics

Designing, planning and carrying through a mathematical task to a successful conclusion
Stating whether a conjecture is true, false or not proven; defining and reasoning; proving and disproving and using counter-examples; using symbolisation; recognising and using necessary and sufficient conditions

Number

Distinguishing between rational and irrational numbers.
Being aware of upper and lower bounds of numbers expressed to a given degree of accuracy.
Calculating the upper and lower bounds in the addition, subtraction, multiplication and division of two numbers expressed to a given degree of accuracy.

Algebra

Calculating growth and decay rates.
Expressing general laws in symbolic form.
Solving a wider range of linear inequalities.
Interpreting and using m and c in $y = mx + c$.
Solving equations using graphical methods.

Measures

Calculating lengths of arcs and areas of shapes involving curved lines; calculating surface area of cylinders and volumes of cones and spheres.

Shape and space

Calculating distances and angles in solids using plane sections and trigonometric ratios.
Using sine, cosine and tangent for obtuse-angled triangles.
Using the relationship between surface areas of similar figures and for volumes of similar 3-D solids.
Understanding laws of addition and subtraction of vectors.

Handling data

Studying a 'population' by sampling and appreciating the degree of reliability of different sizes of samples.
Constructing and interpreting a histogram with understanding of the connection between area and frequency.
Presenting a set of complex data in a simplified form using a variety of diagrams and graphs and computer statistical packages.
Producing a tree-diagram to illustrate the combined probability of several events where these are not independent.

PROGRAMMES OF STUDY

Level 10

Using and applying mathematics

Designing, planning and carrying through a mathematical task to a successful conclusion; presenting alternative solutions and justifying selected route.
Giving definitions which are necessary, sufficient or minimal.
Using symbolisation with confidence; constructing a proof including proof by contradictions.

Number

Calculating the upper and lower bounds in calculations involving a variety of numbers expressed to a given degree of accuracy.

Algebra

Using a calculator or computer, investigate whether a sequence given iteratively converges or diverges.
Manipulating a range of algebraic expressions in a variety of contexts.
Constructing tangents to graphs to determine the gradient.
Finding area under a graph and interpreting the result.
Sketching the graph of functions derived from other functions.

Measures

Determining the possible effects of error on calculations involving measurements.

Shape and space

Knowing and using angle properties of circles.
Sketching the graphs of sine and cosine functions for all angles.
Using sine and cosine rules to solve problems in 2-D and 3-D contexts.
Understanding how transformations are related by combinations and inverses.
Using matrices to transform vectors, representing points in 2-D and 3-D space.
Using matrix algebra to define transformations.

Handling data

Describing a range of variables through different measures of dispersion; calculating standard deviation of a set of data.
Interpreting various types of diagram including critical path diagrams and linear programming.
Consideration of different shapes of histograms representing distributions with special reference to mean and dispersion, including normal distribution.
Understanding and applying conditional probability to an event.
Understanding and applying the probability rule for any two events, i.e. probability of an event (A or B).

RECOMMENDATIONS FOR PROGRAMMES OF STUDY FOR KEY STAGES 1 TO 4
FOR INCLUSION IN DRAFT STATUTORY ORDERS FOR SCIENCE
IN THE NATIONAL CURRICULUM

Council recommends the following programmes of study for levels of attainment 1-10 for inclusion in statutory Orders for science in the National Curriculum.

THE PROGRAMME OF STUDY: 5- TO 7-YEAR-OLDS

This programme of study is presented in two profile components:

Profile component 1 - Exploration of Science

Profile component 2 - Knowledge and Understanding of Science

The ability to communicate, to relate science to everyday life and to explore are essential elements of an initial experience of science. The programme of study and statements of attainment in profile components 1 and 2 are closely linked and both include contributions from all of these essential elements.

Communication: Throughout their study of science, children should develop and use a variety of communication skills and techniques involved in obtaining, presenting and responding to information. They should also have the opportunity to express their findings and ideas to other children and their teacher, orally and also through drawings, simple charts, models, actions and the written word. They should be encouraged to respond to their teacher and to the reports and ideas of other children and become involved in group activities. They should be introduced to books, charts, pictures, videos and to the use of computers to supplement their first-hand experience.

Science in Everyday Life: As children begin to develop maturity and gain increasing knowledge and understanding, they should be given the opportunity to develop an awareness of the role and importance of science in everyday life. This awareness should be encouraged through first-hand experience in school, at home and through visits. Children should use a variety of domestic and environmental contexts as starting-points for learning science.

Exploration of science - Profile component 1

Relevant part of the programme of study

AT1 Children should be encouraged to develop their investigative skills and understanding of science in the context of:

- explorations and investigations largely of the 'Do...', 'Describe which...' and 'Find a way to...' type, involving problems with obvious key variables which can be solved using a qualitative approach and which are set within the everyday experience of children.

These activities should:

- involve children and their teachers in promoting ideas and seeking solutions;
- promote at first hand the exploration of objects and events;
- encourage an appreciation of the need for safe and careful action;
- encourage the sorting, grouping and describing of objects and events in their immediate environment, using their senses and noting similarities and differences;
- increasingly encourage the development of non-standard (e.g. hand spans) and simple standard measuring* skills;
- develop an understanding of the purposes of recording results and so encourage systematic recording using appropriate methods, such as, block graphs and frequency charts.
- develop reporting skills, ideally by talking, but by other means, as appropriate.

Knowledge and Understanding of Science – Profile component 2

Relevant part of the programme of study

- AT2 Children should have opportunities both to observe† first hand and to use books, stories, pictures, charts and videos to find out about a variety of animal and plant life. Over a period of time children should take responsibility for the care of living things, maintaining their welfare by knowing about their needs and understanding the care required.
- AT3 Children should be finding out about themselves, developing their ideas about how they grow, feed, move and use their senses [14], [15]. Using suitable books, pictures and charts, they should be introduced to ideas about how they keep healthy [13] through exercise and personal safety. Children should be introduced to the role of drugs as medicines.
- AT4 Children should consider similarities and differences between themselves and other children by direct observation and through stories, books, videos and pictures.
- AT5 Children should investigate the extent to which a selection of everyday waste products such as garden refuse, paper, plastic materials and cans 'decay naturally' [6]. They should keep records of their observations and use this knowledge to help improve the appearance of their local environment.
- AT6 Children should collect and find similarities and differences in a variety of everyday materials, natural and manufactured, including cooking ingredients, rocks, air and water and other liquids. They should work with and change some of these materials by simple processes such as dissolving, squashing, pouring, bending, twisting and treating surfaces [5], [9], [13], [15].

* measuring or demonstrating an understanding of the task of measurement through manipulating the instrument with help or participating, as far as is possible, with the taking of measurement.

† to observe or consciously notice, by whatever means, using any of the senses.

- Children should collect and find differences and similarities in natural materials found in their locality, including rocks, shells and soil [6]. They should compare samples with those represented or described at second hand. They should observe and record the changes in the weather and relate these to their everyday activities [17].
- AT10 In the context of classroom and outdoor play activities, children should experience natural and manufactured forces which push, pull, make things move, stop things and change the shape of objects. Such experiences could include, for example, road safety activities [11].
- AT11 Children should experience play activities with a variety of magnetic materials and investigate their effects on a range of materials and for a variety of uses. They should explore the Earth's magnetic field using a compass. They should experience simple activities using bulbs, buzzers, batteries and wires.
- AT12 Children's normal work in all areas should involve where appropriate the use of information sources and computers. When appropriate, they should have the opportunity to use tape recorders and television to broaden their experience of science.
- AT13 Children should consider the foods they eat and why they eat them [3]. They should talk or communicate by other means about what they eat and why and when they eat. They should have early experiences with devices, such as toys, which move and store energy [13]. Children should explore the effect of heating common, everyday substances such as ice, water, wax and chocolate, in order to come to an understanding of the role of heating and cooling in bringing about melting and solidifying [6]. They should begin to link the feeling of hot and cold, for example, water, bodies, air with temperature measured by a thermometer.
- AT14 Children should have the opportunity to experience the range of sounds in their immediate environment and to find out about their causes and uses [3]. They should investigate ways of making and experiencing sounds by vocalising and striking, plucking, shaking, scraping and blowing, for example, using familiar objects and simple musical instruments from a variety of cultural traditions. Children should explore various ways of sorting these sounds and instruments.
- AT15 Children should have opportunities to explore a variety of light sources and effects related to shadows, reflection and colour [3], [6].
- AT16 Children should observe closely their local natural environment to detect seasonal changes, including day-length, weather and changes in plants and animals and relate these changes to the passage of time. They should observe, over a period of time, the length of the day, the position of the Sun, and where possible the Moon, in the sky [9], [13].

THE PROGRAMME OF STUDY: 7- TO 11-YEAR-OLDS

This programme of study is presented in two profile components:

Profile component 1 – Exploration of Science

Profile component 2 – Knowledge and Understanding of Science

The ability to communicate, to relate science to everyday life and to explore are essential elements of a developing experience of science. The programme of study and statements of attainment in profile components 1 and 2 are closely linked and both include contributions from all of these essential elements.

Communication: Children should have opportunities to continue to develop and use communication skills in presenting their ideas and in reporting their work to a range of audiences including children, teachers, parents and other adults. In giving an account, either orally or in written form, they should be encouraged to present information in an ordered manner. They should be introduced to the conventions involved in using diagrams, tables, charts, graphs, symbols and models. Children should be given opportunities to participate in small group discussions and they should be introduced to a limited range of books, charts and other sources from which they can gain information. Children should use the computer to store, retrieve and present their work.

Science in Everyday Life: As children begin to gain increasing knowledge and understanding, they should be given the opportunity to develop further an awareness of the role and importance of science in everyday life. This awareness might be developed through investigations (Profile component 1) or through case studies, secondary sources of information or visits. Industrial contexts should be introduced, alongside those of domestic and environmental contexts, as starting-points for children's work in science.

Exploration of Science – Profile component 1

Relevant part of the programme of study

AT1 Children should be encouraged to develop their investigative skills and their understanding of science in activities which:

- promote the fostering and answering of questions;
- encourage a working understanding of safety and care;
- are set within the everyday experience of children and provide opportunities to explore with increasing precision, where appropriate;
- build on their existing practical skills within a given framework;
- require the deployment of an increasingly systematic approach involving the identification and manipulation of obvious, key variables;

These activities should:

- involve variables to be controlled in the development of a 'fair test';
- involve problems which may be solved qualitatively, but which increasingly allow for some quantification of the variables involved;
- encourage the formulation of testable hypotheses;
- develop skills of using equipment and measurement, encouraging children to make decisions about when, what and how to measure;
- encourage the systematic recording of data, for example, in frequency tables and bar charts;
- encourage the searching for patterns in data;
- encourage the interpretation of data, and evaluation against the demands of the problem;
- encourage the development of written and/or oral reporting skills, as appropriate;
- encourage the use of a limited technical vocabulary in communicating findings and ideas.

Knowledge and Understanding of Science – Profile component 2

Relevant part of the programme of study

- AT2 Children should explore and investigate at least two different localities and the ways in which plants and animals are suited to their location. They should explore some ways in which plant and animal behaviour and life cycles are influenced by seasonal and daily changes. Using secondary sources and, if possible, specimens, they should explore the range of past life-forms preserved as fossils. They should have the opportunity to develop skills in identifying locally occurring species of plants and animals by using observable structural features of organisms, both at first hand and through a range of sources chosen by the teacher, with the opportunities to develop increasing independence in the use of these sources. They should develop an awareness and understanding of the necessity for sensitive collection of organisms used in any study of the environment and the need to look after them properly.
- AT3 Children should investigate some aspects of feeding, support, movement and behaviour in relation to themselves and other animals [2]. They should be introduced to basic ideas about the processes of breathing, circulation, growth and reproduction. They should explore ways in which good health can be promoted, using a range of secondary sources chosen by the teacher. They should be introduced to the fact that while all medicines are drugs, not all drugs are medicines; and they should begin to be aware of the catastrophic effect on health resulting from an abuse of drugs. They should investigate the effects of physical factors on the rate of plant growth, for example, light intensity, temperature, and the amount of fertiliser [2], [9].

- AT4 Children should investigate and measure the similarities and differences between accessible plants and animals [2] and their fossil counterparts. In this study they should give attention to the welfare and protection of living material.
- AT5 Children should study aspects of their local environment which have been affected by human activity. These may include farming, industry, sewage disposal, mining or quarrying. Where possible this should be by first-hand observation, but secondary sources may need to be used where there are considerations of safety. They should observe and record the significant features of the process; the range and origins of any raw materials; waste disposal procedures and the usefulness of any product(s).
- AT6 Children should work with a number of different everyday materials. Using secondary sources, they should explore their origins and how materials are used in construction. Properties, such as mass, volume, strength, hardness, flexibility, compressibility and solubility should be investigated and measured [13], [14]. Children should explore chemical change in a number of everyday materials, such as making plaster of Paris, making cement and firing clay. They should find out the common use of materials and relate the use to the properties which they have investigated [14]. They should learn about the dangers associated with the use of everyday materials, such as bleach and hot oil.
- AT9 Children should investigate natural materials (rocks, minerals, soils), should sort them according to simple criteria, and relate them to their uses and origins, using books and other sources. They should be aware of local distributions of some types of natural materials (sands, soils, rocks) [5], [6]. They should observe, through urban or rural fieldwork, how weather affects natural materials [2], [3], [6] (including plants) in their surroundings and how soil develops. They should have the opportunity to make regular, quantitative observations of the weather and the seasons of the year [2], [5], [6].
- AT10 Children should use measurements to compare the effects of forces in the context of, for example, bridge building. They should investigate the strength of shapes and structures. They should experience the forces involved in floating and sinking. They should explore the forces which cause movement. This work should be set in everyday contexts such as transport (including cycling and sailing), balancing systems and hydraulic mechanisms in model making [9].
- AT11 Children should have the opportunity to construct simple circuits and investigate the effects of using different components and materials in these circuits. They should learn how to record the construction details of a circuit by drawings and diagrams. They should learn about the dangers associated with the use of mains electricity through research of appropriate sources.
- AT12 Children should have the opportunity to use and investigate the transmission and storage of information using computers, sensors and the telephone. Children should use these in experiments and to store, retrieve and present their work.
- AT13 Children should investigate changes that occur when familiar substances are heated and cooled [6]. They should investigate a variety of devices which are self-propelled and which can store energy, for example, in rubber bands,

- springs and balloons. Through the use of first-hand methods and secondary sources, children should investigate the range of fuels (energy sources) used in their home or school and where these fuels come from.
- AT14 Children should explore the changes in pitch, loudness and timbre of a sound by changing, for example, the length, thickness or material of a vibrating object and through ways of causing sound, for example, different mallets, overblowing.
- AT15 Children should explore light passing through different transparent objects, for example, lenses, water, prisms. Children should carry out investigations on shadows and the formation of images in mirrors and other devices. Children should represent in drawings and diagrams their ideas about how light behaves.
- AT16 Children should be given the opportunity to investigate changes in the night sky, in particular the position of the Moon, both through direct observation and by using secondary sources. Children should use a simple model of the solar system to attempt explanations of day and night, year length and changes in the aspect of the Moon [2], [9].

THE PROGRAMME OF STUDY: 11- TO 14-YEAR-OLDS

This programme of study is presented in two profile components:

Profile component 1 – Exploration of Science

Profile component 2 – Knowledge and Understanding of Science

The ability to communicate, to apply and to investigate scientific and technological knowledge and ideas are essential elements of a developing experience of science. The programme of study and statements of attainment in profile components 1 and 2 are closely linked and both include contributions from all of these essential elements.

Communication: Pupils should be given the opportunity to extend their use of scientific and mathematical conventions and symbols. They should be encouraged and helped to read actively and for a purpose through the use of an extended range of secondary sources. They should take increasing responsibility for selecting the resources on which they draw. Pupils should be encouraged to express their ideas by various means and to respond to those of others, to record their work. They should begin to use, with increasing confidence, information and data accessed using a computer.

The Application of Science: Pupils should be given opportunities to develop their awareness of the role and importance of science in everyday life; and building on their earlier experience, their growing knowledge and understanding and their increasing maturity to study how science is applied in a variety of contexts. They should consider the benefits and drawbacks of applying scientific and technological ideas to themselves, industry, the environment and the community. They should begin to make personal decisions and judgements based on their scientific knowledge of issues concerning personal health and well-being, safety and the care of the environment. Through this study, they should begin to understand how science shapes and influences the quality of their lives.

Exploration of Science – Profile component 1

Relevant part of the programme of study

AT1 Pupils should be encouraged to develop their investigative skills and their understanding of science through systematic experimentation and investigations which:

- are set within the everyday experience of pupils and in wider contexts, which require the deployment of previously encountered concepts and their investigative skills to solve practical problems;
- develop and use an increasingly systematic and safe approach;
- require that pupils plan and carry through investigations in which they may have to vary more than one key variable and where the variable to be measured can be treated continuously;
- require increasingly precise quantitative approaches to the measurement of key variables;
- require pupils to make strategic decisions about the number, range and accuracy of measurements, and select and use the appropriate apparatus and instruments;
- encourage systematic recording using methods appropriate to the data and the purpose of the activity;
- encourage the interpretation and evaluation of collected data against the demands of the problem, using mathematical relationships, where appropriate;
- encourage the searching for patterns in data and the ability to make simple predictions based on findings;
- encourage the use of technical vocabulary when reporting findings and conclusions.

Knowledge and Understanding of Science – Profile component 2

Relevant part of the programme of study

AT2 Pupils should study a variety of localities at first hand and through secondary sources, to investigate the range of seasonal and daily variability in physical factors and the features of organisms which enable them to survive these changes. They should relate environmental factors to human well-being. They should explore in a general way, the cycling of materials made possible by the activity of microbes and other living organisms. They should broaden their study of locally occurring plants and animals to other organisms and, through this, be introduced to the major taxonomic groups. They should have opportunities to group organisms on the basis of similarities and differences and to use keys to name organisms. They should communicate their findings by notes and summaries, recorded by various means, and select from a range of sources in seeking information.

AT3 Pupils should explore and investigate how flowering plants and mammals are

normally organised at cellular and macroscopic levels [2]. They should make a more detailed study of food and feeding (including digestion and assimilation), respiration, growth and reproduction, particularly as they relate to human beings [13]. They should investigate the requirements for photosynthesis in green plants and the resulting products (sugars, starch and oxygen) [2], [4]. They should have opportunities to explore and investigate the uses of enzymes and microbes such as in the baking, brewing and dairy industries. Through the use of a range of secondary sources, they should extend their study of ways in which the healthy functioning of the human body may be promoted or disrupted by diet, lifestyle, bacteria and viruses and the use and abuse of medicines and drugs [2]. They should study the physical and emotional factors necessary for the well-being of human beings in the early stages of their development. They should be encouraged to select appropriately from the range of information available to them.

- AT4 Pupils should investigate variation between individuals in a range of living things, giving due attention to the welfare of living things. They should translate data into trends and norms and consider both genetic and environmental causes.
- AT5 Pupils should investigate ways water resources are managed and, through use of secondary sources and first-hand practical experience, ways of monitoring water purity. They should consider the presence of soluble and insoluble materials, pH and the oxygen content of water [9], [6]. Pupils should observe the effect of corrosive gases on common metals and ways these effects can be minimised [7]. Using secondary sources of evidence and other data, they should come to appreciate that industries require raw materials to produce beneficial products and services, and that these aspects need to be balanced against any harmful effects on the environment. They should study the effects of supply and demand on the exploitation of raw materials. They should be introduced to the classification of waste products of human activities as biodegradable or non-biodegradable.
- AT6 Pupils should have the opportunity to study a wider range of physical and chemical properties of everyday materials, including living materials, making measurements where possible, in order to develop their understanding of the main ways of classifying them [5]. They should investigate various techniques for separating and purifying mixtures. They should classify a number of metals and non-metals, some by direct observation and others with the help of tables of data.
- AT7 Pupils should participate in experiments which investigate examples of different types of reaction such as combustion, thermal decomposition, corrosion, [5], metal extraction, neutralisation, electrolysis [11], and fermentation [3], to illustrate the way in which chemical reactions lead to the formation of new materials and also involve energy changes. They should have the opportunity to relate these reactions to information about manufacturing processes involved in metal extraction, oil fractionation and fermentation [21], through use of a range of sources.
- AT8 Pupils should experience a range of familiar examples of changes of state, evaporation, diffusion and dissolving and be given opportunities to explain them in terms of their developing ideas of the particulate model of matter. Their study should extend to an investigation of the temperature changes

that occur during changes of state and to other changes, such as expansion, that occur during heating and cooling [6].

- AT9 Pupils should investigate practically and by use of secondary sources the properties of water and the causes of its transformation from state to state [8], [13], its role in the atmosphere and oceans, and on the Earth's surface as both a landscaping agent and a resource [5], [8], [11]. They should study factors which influence the weather, including how different airstreams give different weather. They should investigate by observation, experimentation and fieldwork, the properties and formation of igneous, metamorphic and sedimentary rocks [7], and link these to major features and changes on the Earth's surface [6], [7], [8]. They should be aware of the time-scales involved in the operation of geological processes, and be able to evaluate earlier ideas concerning the age of the Earth [4], [8], [16]. They should link the properties of minerals and rocks to their uses as raw materials [5], [6], [7].
- AT10 Pupils should investigate the factors involved in producing and maintaining motion. This work should make reference to friction and be set in the context of human and vehicular movement with particular reference to road safety. Their investigation should include the measurement of speed.
- AT11 Pupils should investigate a wider range of electrical components in electrical circuits and investigate the effects of electric currents [7]. They should be provided with opportunities to investigate and test their ideas about the nature of electric charge and electric circuits. They should be introduced to an interpretation of common electrostatic effects and experience activities linking flow of charge to electric current. Pupils should investigate qualitatively the properties of magnets and electromagnets and the nature of electric and magnetic fields. Their investigation should be in the context of everyday applications and devices such as electric motors, dynamos, compasses, transformers, sparks, loudspeakers and fuses. They should plot the Earth's magnetic field in the locality of the school.
- AT12 Pupils should experiment with circuits containing sensors activated by a variety of environmental factors such as temperature, light, moisture, tilt, pressure and magnetic field. Using a systems approach, pupils should have an opportunity to use logic gates as simple two-state switching circuits together with input sensors and output devices, in simple decision making and control circuits. They should have the opportunity to develop skills in the use of computers to store and process information and to control and collect data during experiments.
- AT13 Pupils should investigate the effectiveness of simple machines and tools and how they can be used to solve everyday problems. Through this work, they should be introduced to the principle of energy conservation. Pupils should have experience of a wide range of processes involving energy transfer in both domestic contexts and in familiar devices. They should be introduced to the idea that useful energy decreases. The joule should be introduced, without derivation, as a unit for the measurement of energy. They should discuss the use of fuel/oxygen systems as concentrated sources of energy, in living things and in engines, heating systems and other devices used by humans [3]. Through the use of a range of resource materials, pupils should survey national and global sources of energy. They should consider the importance of energy

from the Sun [3], nuclear energy, the origin and accumulation of fossil fuels and the use of biomass as a fuel.

AT14 Through access to a range of sources of information, pupils should study the way the ear works, common defects of hearing, the effects of loud sounds on the ear and the control of noise and sound levels in the environment [2]. They should have opportunities to investigate the audible range. Pupils should investigate the effect on sound of the shape and materials of the built environment, for example, reverberation times and insulation rates.

AT15 Pupils should have opportunities to communicate their ideas and use a range of sources to explore the nature of vision, leading to an appreciation that vision occurs because light enters the eye and signals are interpreted by the brain. Pupils should study the behaviour of light particularly absorption, reflection, refraction and colour formation. They should have opportunities to appreciate the ways light is controlled and used in a range of common optical devices, for example, mirrors, simple camera, projector, fibre optics. Through the use of a range of sources, they should study the function of the eye, extending to common defects and their correction.

AT16 Pupils should further develop their study of the solar system both by direct naked eye observation and the use of secondary sources. They should consider changes of day length and seasonal changes, ideas about the position of the Sun and planets within the solar system, and the position of the solar system in the universe. They should study the extent of human exploration of space.

AT17 Through their own investigations and the use of text, film, other secondary sources, and case studies, for example, focused on the life and work of a famous scientist and/or the development of an important idea in science, pupils should be given opportunities to:

- study the ideas and theories used in other times to explain natural phenomena;
- relate such ideas and theories to present scientific and technological understanding and knowledge;
- compare such ideas and theories with their own emerging understanding and relate them to available evidence.

THE PROGRAMME OF STUDY: 14- TO 16-YEAR-OLDS

This programme of study is presented in two profile components:

Profile component 1 – Exploration of Science

Profile component 2 – Knowledge and Understanding of Science

The ability to communicate, to apply and to investigate and use scientific and technological knowledge and ideas to make informed judgement are essential elements in the study of science. The programme of study and statements of attainment in profile components 1 and 2 are closely linked and both include contributions from all of these essential elements.

Communication: Pupils should be given the opportunities further to develop their skills of reporting and recording. They should be encouraged to articulate their own ideas and work independently or contribute to group efforts. They should develop research skills through selecting and using reference materials and through gathering and organising information from a number of sources and perspectives. They should have the opportunity to translate information from one form to another to suit audience and purpose and to use databases and spread sheets in their work.

The application and economic, social and technological implications of science: Pupils should be given opportunities to develop their awareness of the role and importance of science in everyday life; and building on their earlier experience, their breadth of knowledge and understanding and their increased maturity to study how science is applied in a variety of contexts. They should use their science knowledge and skills to make decisions and judgements and consider the effect of scientific and technological developments on individuals, communities, and environments. Through this study, they should begin to understand the power and the limitations of science in solving industrial, social and environmental problems and recognise the competing priorities and risks involved.

Exploration of Science – Profile component 1

Relevant part of the programme of study

- AT1 Pupils should be encouraged to develop their investigative skills and understanding of science in activities which:
- are set in the everyday experience of pupils and in novel contexts, involving increasingly abstract concepts and the application of knowledge, understanding and skills, where pupils need to make decisions about the degree of precision and safe working required;
 - promote invention and creativity;
 - encourage detailed planning of the activity and its subsequent evaluation in the light of findings;
 - encourage the use of secondary sources in investigative work;
 - are increasingly complex because there are derived and/or interacting variables;
 - require key variables to be controlled and pupils to recognise that need;
 - require pupils to generate theoretical models and to test them by investigation;
 - may take place over an extended period and may call for the use of sampling techniques;
 - require accurate measurement, with identification of, and accounting for, experimental error and anomalous results;

- encourage the systematic recording and presentation of data using, as appropriate, a full range of forms, including graphs, and mathematical relationships;
- encourage pattern searching in complex data and predictions requiring abstract reasoning;
- involve the critical evaluation of data;
- promote the production of written critical accounts.

Knowledge and Understanding of Science – Profile component 2

Relevant part of the programme of study

- AT2 Pupils should make a more detailed and quantitative study of a locality including the investigation of the abundance and distribution of common species, and the ways in which they are adapted to their location. They should explore the factors affecting population size, including human populations. They should seek out, select and use reference materials in making this study and translate the information from one form to another in communicating it to a specific audience. They should consider the cycling of the elements and relate their scientific knowledge to consider the impact of human activity on these cycles in managed ecosystems like farms and forests, where manipulation of the ecosystem imposes on us a duty of care.
- AT3 Pupils should explore and investigate sensitivity, coordination and response, and should relate behaviour to survival and reproduction in plants and animals. They should investigate plant mineral requirements; limiting factors in photosynthesis and the uses of photosynthetic products in plants. They should explore the ways in which the internal environments of plants and animals are maintained including water relations, temperature control, defence mechanisms, solute balance (for example sugars, carbon dioxide, urea) and the human embryonic environment. They should have opportunities to consider examples of technologies used to promote, improve and sustain the quality of life. They should consider how hormones can be used to control and promote fertility, growth and development in plants and animals and be aware of the implications of such use. They should have opportunities to consider the effects of, for example, solvents, alcohol, tobacco and other drugs on the way the human body functions. In this study they should be given opportunities to work independently or in groups to seek out, select and use reference materials and to organise the information from a range of sources and perspectives.
- AT4 Pupils should have opportunities to measure the differences between individuals. They should consider the interaction of genetic and environmental factors (including radiation) in variation [6], [5], [8]. Using the concept of the gene, and through use of a wide range of secondary sources, they should explore the basic principles of inheritance in plants and animals and their application in the understanding of inherited diseases. Using sources which give a range of perspectives, they should have the opportunity to consider the basic principles of genetic engineering in relation to drug and hormone production, as well as being aware of any ethical considerations that

such production involves. They should explore the ideas of variability and selection leading to evolution and selective breeding and cloning.

- AT5 Pupils should have opportunities through fieldwork, investigations and the use of secondary sources to consider current concerns about human activity including the exploitation of resources, the disposal of waste products on the Earth, in its oceans and atmosphere and the effects on climate [2], [4], [6], [7], [9]. The work should encourage pupils to use their scientific knowledge, weigh evidence and form balanced judgements bearing in mind relevant factors, including economic factors [13], [21].
- AT6 Pupils should have the opportunity at first and second hand to consider suitable materials to use in particular practical purposes. This study should also consider the energy requirements [13] and the social, economic, environmental and health and safety factors associated with manufacturing materials [4], [5], [9]. Pupils should have the opportunity to make mixtures that have important everyday applications, and illustrate important types of mixtures (emulsions, foams, gels and solutions). They should be introduced to the idea of composite materials, illustrated by some common examples such as reinforced concrete, glass-reinforced plastic, bone, synthetic fibres. They should carry out a more detailed study of selected elements in order to understand the different ways in which they can be classified [8]. The study should extend to the relationship between the properties of materials and their structures [8].
- AT7 Pupils should investigate the different factors that affect the rate of chemical reactions and relate these to the practical problems associated with the manufacture of materials and to everyday biochemical change, for example, food deterioration. They should have opportunities to research the manufacturing processes involved in cracking oil, the chlor-alkali industry and the production of plastics and fertilisers [21] and to relate this research to experimental methods used in the school laboratory. They should explore the social, economic, environmental and health and safety implications of manufacture, including the effects of changing economic conditions on the suitability of particular processes [5], [21]. The study should extend to an opportunity to relate reactions such as electrolytic decomposition, neutralisation and ionic reactions in solution to the models developed in [8].
- AT8 Pupils should investigate the kinetic theory as a model, through experiments and secondary sources, to explain changes of state and a range of other phenomena. Using examples arising from the programmes of study, they should develop models to explain the difference between elements and compounds in terms of atoms, molecules and ions. They should have the opportunity to extend these models in order to describe the structure of the atom and appreciate the explanation these afford for radioactivity [13]. They should have opportunities, using a wide range of secondary sources, to study the effects of radioactive emissions, different methods of detecting ionising radiations and their effects on matter [4], [15], [21] and living organisms. Pupils should have experience of the symbolic representation of these models in three-dimensional form, diagrams and equations [6], [7].

Pupils should study, through laboratory and fieldwork, the evidence which reveals the mode of formation, and later deformation of rocks, and the sources of energy that drive such processes [8], [10], [13]. They should examine data that suggests that the Earth has a layered structure [14], [15], including density contrast between surface rocks and the whole Earth, transmission of earthquake waves and the Earth's magnetic field. They should investigate the evidence that favours the theory of plate tectonics and know that plate movements have influenced the nature of rock record and the global distribution of the Earth's physical resources [5], [7], [13]. They should consider earlier theories concerning movements of the Earth's crust, and how these were changed by advances in other fields of science and technology [8], [11], [17]. They should study the origin of the atmosphere and the ocean and the factors which maintain atmospheric composition [2], [3], [5], [16], and make simple comparisons with other similar planets in the solar system. They should study atmosphere circulation including the qualitative relationship between pressure and winds

- AT10 In the context of familiar situations, including road transport, sport and space travel, pupils should investigate the effects of forces on motion. They should explore examples of motion including free fall and circular motion, the movement of projectiles and the effect of friction. They should consider the use of ideas of momentum and energy in relation to the motion of systems, for example, in collisions, rockets and jet propulsion [16]. They should experience everyday applications of hydraulics. Pupils should also investigate at first hand and through the use of secondary sources, the relationship between forces and their effects in the context of the properties of common materials and the way these determine the design and testing of relevant artefacts and structures [6].
- AT11 In the context of the domestic environment, pupils should study the use of electricity for the transfer of energy, the measurement of energy transferred, and its relation to costs of using common domestic devices [13]. Such work should also develop an understanding of the dangers of electricity and the standard features and procedures to protect the users of electrical equipment. The methods by which electricity is distributed on a national scale should be introduced through visits or videos and practical work with transformers and alternating current [13]. Pupils should be given an opportunity to study electric circuits in a more quantitative way. They should be introduced to the measurements of voltage, current, electrical resistance, energy transferred and electrical power and to the relationships between these quantities. The study should extend to cover the flow of electrons in a circuit, thermionic emission and its application in cathode ray tubes and the production of x-rays.
- AT12 Pupils should investigate the behaviour of a bistable circuit made from two logic gates. They should consider its role as a simple memory circuit and use monostables and bistables to perform useful tasks. Through the use of secondary sources and by investigations, pupils should consider the common features underlying various communication systems in the context of everyday applications. They should consider some of the economic factors associated with different communication systems [21]. Pupils should study the methods of coding, transmitting and storing information in a range of systems, including biological, mechanical, optical and electronic [14], [15]. During their

study of science, pupils should have the opportunity to use information technology to gather and display data from experiments, to simulate physical, biological and chemical systems and their behaviour, to access and organise data relevant to their study of science, and to use programmable systems to control external electronic, electrical or mechanical devices.

- AT13 Pupils should investigate the relationship between forces and devices used for doing work, including the human body. They should have opportunities to investigate the way energy is transferred in a variety of personal and practical contexts. These investigations should include the transfer by conduction, convection and radiation, particularly in domestic contexts through experimentation and reference to secondary sources. They should be introduced to the ideas of efficiency of energy transfer and of power [11]. Through the examination of data relating to the lifetimes of resources, pupils should understand that fossil fuel resources are limited. They should have opportunities to consider the longer-term implications of the world-wide patterns of distribution and use of energy resources [5]. Pupils should be introduced to the ways electricity is generated in power stations from a range of sources, both renewable and non-renewable [11]. By the use of secondary sources, pupils should consider the economic and environmental implications of using particular energy sources. This study should include the Greenhouse Effect. They should be given opportunities to discuss the ways in which society comes to decisions concerning sources [5], [21].
- AT14 Pupils should explore sound in terms of wave motion and its frequency. They should have opportunities to develop their understanding of the properties and behaviour of sound by developing a wave model, for example through observations of waves in springs and on water. This should be related to pupils' experience of sounds and musical instruments, acoustic and electronic instruments and recording and synthesising. They should be given the opportunity to investigate devices such as microphones and loudspeakers which act as transducers and be introduced to the mechanisms underlying various communications systems (telephone, radio) on which a complex society depends [12]. Pupils should investigate the characteristics and effects of vibration, including resonance, in a range of mechanical systems.
- AT15 Through a variety of approaches, including experimentation and the study of secondary sources, pupils should investigate the electromagnetic family of waves, their uses and their potential dangers in
- domestic situations (microwaves, infra-red, ultra violet);
 - communication (radio, microwaves, light) [12];
 - medicine (x-rays and gamma rays) [8].
- AT16 Pupils should have opportunities to use the idea of gravitational force to explain the movement and positions of the Earth, Moon, Sun, planets and other bodies in the universe. The idea of gravitational force should also be applied to tides and satellites. Pupils should consider the possibilities and limitations of space travel [10], using understanding gained through discussion of information from a variety of sources. Pupils should use a variety of secondary sources to collect and discuss ideas that have been used,

historically and more recently, to explain the character and origin of the Earth, other local planets, stars and the universe itself [17].

AT17 Pupils should continue the programme of study outlined for key stage 3, but in addition they should also:

- distinguish between claims and arguments based on scientific considerations and those which are not;
- consider how the development of a particular scientific idea or theory relates to its historical, and cultural – including the spiritual and moral – context;
- study examples of scientific controversies and the ways in which scientific ideas have changed.

7. RECOMMENDATIONS FOR ATTAINMENT TARGETS
AND ASSOCIATED STATEMENTS OF ATTAINMENT, WITH EXAMPLES,
FOR INCLUSION IN DRAFT STATUTORY ORDERS FOR SCIENCE
IN THE NATIONAL CURRICULUM

Council recommends the following 17 attainment targets and associated statements of attainment, with examples, for inclusion in statutory Orders for science in the National Curriculum.

For reporting and assessment, the attainment targets will be grouped as follows:

Profile component 1 (attainment target 1)

Exploration of science, communication and the application of knowledge and understanding.

Profile component 2 (attainment targets 2-17)

Knowledge and understanding of science, communication, and the applications and implications of science.

EXPLORATION OF SCIENCE - ATTAINMENT TARGET 1

Pupils should develop the intellectual and practical skills that allow them to explore the world of science and to develop a fuller understanding of scientific phenomena and the procedures of scientific exploration and investigation. This work should take place in the context of activities that require a progressively more systematic and quantified approach which draws upon an increasing knowledge and understanding of science. The activities should encourage the ability to

- (i) plan
- (ii) carry out
- (iii) interpret results and findings
- (iv) draw inferences
- (v) communicate exploratory tasks and experiments.

Relevant part of the programme of study

5 to 7 Children should be encouraged to develop their investigative skills and understanding of science in the context of:

- explorations and investigations largely of the 'Do...', 'Describe which...' and 'Find a way to...' type, involving problems with obvious key variables which can be solved using a qualitative approach and which are set within the everyday experience of children.

These activities should:

- involve children and their teachers in promoting ideas and seeking solutions;
- promote at first hand the exploration of objects and events;
- encourage an appreciation of the need for safe and careful action;
- encourage the sorting, grouping and describing of objects and events in their immediate environment, using their senses and noting similarities and differences;
- increasingly encourage the development of non-standard (e.g. hand spans) and simple standard measuring skills;
- develop an understanding of the purposes of recording results and so encourage systematic recording using appropriate methods, such as, block graphs and frequency charts;
- encourage the interpretation of results;
- develop reporting skills, ideally by talking, but by other means, as appropriate.

Relevant part of the programme of study

7 to 11

Children should be encouraged to develop their investigative skills and their understanding of science in activities which:

- promote the fostering and answering of questions;
- encourage a working understanding of safety and care;
- are set within the everyday experience of children and provide opportunities to explore with increasing precision, where appropriate;
- build on their existing practical skills within a given framework;
- require the deployment of an increasingly systematic approach involving the identification and manipulation of obvious, key variables;
- involve variables to be controlled in the development of a 'fair test';
- involve problems which may be solved qualitatively, but which increasingly allow for some quantification of the variables involved;
- encourage the formulation of testable hypotheses;
- develop skills of using equipment and measurement, encouraging children to make decisions about when, what and how to measure;
- encourage the systematic recording of data, for example, in frequency tables and bar charts;
- encourage the searching of patterns in data;
- encourage the interpretation of data, and evaluation against the demands of the problem;
- encourage the development of written and/or oral reporting skills, as appropriate;
- encourage the use of a limited technical vocabulary in communicating findings and ideas.

Relevant part of the programme of study

11 to 14 Pupils should be encouraged to develop their investigative skills and their understanding of science through systematic experimentation and investigations which:

- are set within the everyday experience of pupils and in wider contexts, which require the deployment of previously encountered concepts and their investigative skills to solve practical problems;
- develop and use an increasingly systematic and safe approach;
- require that pupils plan and carry through investigations in which they may have to vary more than one key variable and where the variable to be measured can be treated continuously;
- require increasingly precise quantitative approaches to the measurement of key variables;
- require pupils to make strategic decisions about the number, range and accuracy of measurements, and select and use the appropriate apparatus and instruments;
- encourage systematic recording using methods appropriate to the data and the purpose of the activity;
- encourage the interpretation and evaluation of collected data against the demands of the problem, using mathematical relationships, where appropriate;
- encourage the searching for patterns in data and the ability to make simple predictions based on findings;
- encourage the use of technical vocabulary when reporting findings and conclusions.

Relevant part of the programme of study

14 to 16 Pupils should be encouraged to develop their investigative skills and understanding of science in activities which:

- are set in the everyday experience of pupils and in novel contexts, involving increasingly abstract concepts and the application of knowledge, understanding and skills, where pupils need to make decisions about the degree of precision and safe working required;
- promote invention and creativity;
- encourage detailed planning of the activity and its subsequent evaluation in the light of findings;
- encourage the use of secondary sources in investigative work;
- are increasingly complex because there are derived and/or interacting variables;
- require key variables to be controlled and pupils to recognise that need;
- require pupils to generate theoretical models and to test them by investigation;
- may take place over an extended period and may call for the use of sampling techniques;
- require accurate measurement, with identification of, and accounting for, experimental error and anomalous results;
- encourage the systematic recording and presentation of data using, as appropriate, a full range of forms, including graphs, and mathematical relationships;
- encourage pattern searching in complex data and predictions requiring abstract reasoning;
- involve the critical evaluation of data;
- promote the production of written critical accounts.

Statements of attainment

Noting guidance from the examples given in the programme of study, pupils' attainment should be assessed in the context of investigative work. It is not anticipated that one piece of investigative activity will provide a suitable basis for assessing all statements of attainment given at each level.

Pupils should be assessed in terms of their ability to:

- Level 1
- observe familiar materials and events in their immediate environment, at first hand, using their senses.
 - describe and communicate their observations, ideally through talking in groups, or by other means within their class.

-
- Level 2
- ask questions and suggest ideas of the 'how' and 'why' variety.
 - identify simple variables, such as hot/cold, rough/smooth.
 - use non-standard and standard measures.
 - list and collate observations.
 - interpret findings by associating one factor with another, such as light objects float.
 - record findings in charts, drawings and other appropriate forms.

-
- Level 3
- identify and describe simple variables that change over time, such as growth of a plant.
 - select and use simple measuring instruments to enhance observations, for example, a stop clock or hand lens.
 - quantify variables, as appropriate, to the nearest labelled division of simple measuring instruments, such as a rule.
 - record findings in tables and bar charts.
 - interpret simple pictograms and bar charts.
 - interpret observations in terms of a generalised statement, for example, the greater the suspended weight, the longer the spring.
 - describe activities carried out by sequencing the major features.
-

Level 4

- suggest ideas which lead to investigations.
- plan and safely carry out an investigation where the plan indicates that the relevant variables have been identified and others controlled.
- formulate a testable hypothesis.
- construct 'fair tests'.
- select and use a range of measuring instruments, as appropriate, to quantify observations of physical quantities, such as volume and temperature.
- record results by the construction of simple tables, bar charts, pie charts, line graphs, as appropriate.
- draw conclusions from experimental results.
- interpret written instructions and diagrammatic representations.
- describe investigations in the form of ordered prose, using a limited technical vocabulary.

Level 5

- suggest simple questions for investigation and safely carry out an investigation to answer them.
 - use simple concepts, knowledge and skills in the design of the investigation and the interpretation of results.
 - identify and manipulate relevant independent and dependent variables, choosing appropriately, ranges, numbers and values.
 - select and use measuring instruments to quantify variables and use more complex measuring instruments with the required degree of accuracy, such as minor divisions on ammeters and forcemeters.
 - make written statements of the patterns derived from the data obtained from various sources.
-

Level 6

- contribute to the analysis and investigation of a collaborative exercise in which outcomes are derived from the results of a number of different lines of enquiry, possibly including experimentation, survey and use of secondary sources, in the context of which each pupil is able to:
 - use experience and knowledge to make predictions in new contexts.
 - identify and manipulate two discrete independent variables and control other variables.
 - prepare a detailed written plan, where the key variables are named and details of the experimental procedure are given.
 - record data in tables and translate it into appropriate graphical forms.
 - produce reports which include a critical evaluation of certain features of the experiment, for example, reliability, validity of measurements, experimental design.
-

Level 7

- plan, design and safely carry out an entire investigation to test a hypothesis.
 - identify and manipulate two continuous independent variables and control other variables.
 - make decisions about range and number of values for independent variables and select appropriate instruments to measure the dependent variable.
 - select appropriate methods of recording data.
 - produce a systematically structured and, as appropriate, illustrated report of an entire investigation and the data and new ideas generated.
 - accurately use and interpret scientific nomenclature, symbols and conventions in communicating findings.
-

Level 8

- demonstrate an experiment to elucidate a theory, concept or model, and use the results to demonstrate a clear understanding of the original construct.
 - make generalisations from several data sets including self-generated data.
 - prepare and deliver a report matched to audience which incorporates background material from a variety of sources.
-

In the context of an extended project, pupils are able to:

- initiate a piece of self-generated background research employing a variety of sources of information.
- plan a range of exploratory techniques, for example, experimental, literature searches, data logging and analysis.
- interpret data in the light of experimental findings and appropriate scientific knowledge and understanding.
- draw conclusions and make inferences using, as appropriate, data tables and statistical data.
- make a presentation of their research and investigation.

Level 10

In the context of the investigation defined in level 9, pupils are able to

- evaluate critically the entire project in terms of sources of unreliability and invalidity.
 - suggest alternative and considered improvements to experimental technique.
 - formulate further testable hypotheses supported by the knowledge and understanding generated.
-

THE VARIETY OF LIFE - ATTAINMENT TARGET 2

Pupils should develop their knowledge and understanding of the diversity and classification of past and present life-forms, and of the relationships, energy flows, cycles of matter and human influences within ecosystems.

Relevant part of the programme of study

5 to 7 Children should have opportunities both to observe first hand and to use books, stories, charts and videos to find out about a variety of animal and plant life. Over a period of time children should take responsibility for the care of living things, maintaining their welfare by knowing about their needs, and understanding the care required.

7 to 11 Children should explore and investigate at least two different localities and the ways in which plants and animals are suited to their location. They should explore some ways in which plant and animal behaviour and life cycles are influenced by seasonal and daily changes. Using secondary sources and, if possible, specimens, they should explore the range of past life-forms preserved as fossils.

They should have the opportunity to develop skills in identifying locally occurring species of plants and animals by using observable structural features of organisms, both at first hand and through a range of sources chosen by the teacher, with the opportunities to develop increasing independence in the use of these sources. They should develop an awareness and understanding of the necessity for sensitive collection of organisms used in any study of the environment and the need to look after them properly.

11 to 14 Pupils should study a variety of localities at first hand and through secondary sources, to investigate the range of seasonal and daily variability in physical factors and the features of organisms which enable them to survive these changes.

They should relate environmental factors to human well-being.

They should explore in a general way, the cycling of materials made possible by the activity of microbes and other living organisms.

They should broaden their study of locally occurring plants and animals to other organisms and, through this, be introduced to the major taxonomic groups. They should have opportunities to group organisms on the basis of similarities and differences and to use keys to name organisms. They should communicate their findings by notes and summaries, recorded by various means, and select from a range of sources in seeking information.

Pupils should make a more detailed and quantitative study of a locality including the investigation of the abundance and distribution of common species, and the ways in which they are adapted to their location. They should explore the factors affecting population size, including human populations. They should seek out, select and use reference materials in making this study and translate the information from one form to another in communicating it to a specific audience.

They should consider the cycling of the elements and relate their scientific knowledge to consider the impact of human activity on these cycles in managed ecosystems like farms and forests, where manipulation of the ecosystem imposes a duty of care.

Statements of attainment

Pupils should:

- Level 1
- know that there is a wide variety of living things, which includes human beings.
-

- Level 2
- know that plants and animals need certain conditions to sustain life.
 - understand how living things are looked after and be able to treat them with care and consideration.
-

- Level 3
- be able to recognise similarities and differences among living things.
 - be able to sort living things into broad groups according to observable features.
 - know that living things respond to seasonal and daily changes.
-

- Level 4
- be able to recognise similarities and differences both within and between groups of plants and animals.
 - understand the process of decay and its application in the re-use of biological material in everyday life.
 - understand the process leading to preservation of plants and animals as fossils.
-

- Level 5
- understand that the differences in physical factors between localities including differences in seasonal and daily changes are reflected in the different species of plants and animals found there.
 - be able to assign organisms to their major groups using keys and observable features.
 - be able to make reasoned judgements about the environmental issues concerned with the use of fertilisers in agriculture and horticulture.
-

- Level 6
- understand that organisms have features which enable them to survive in the conditions where they normally live.
 - know that the balance of materials in a biological community can be maintained by the re-cycling of materials and that human activities can affect this re-cycling.
-

- Level 8
- understand the cycling of an important element including the role of microbes and other living organisms in maintaining the cycle.
 - understand the role of microbes in sewage disposal and composting.
 - understand pyramids of numbers and biomass and how materials for growth and energy are transferred through ecosystems.
-

- Level 9
- be able to organise information from a number of sources to present an understanding of the relationships between population growth and decline and environmental resources, including the control of human populations.
 - understand that food production involves the manipulation of ecosystems or the creation of artificial ecosystems, such as farms and forests, and that such manipulation imposes a duty of care.
 - be able to evaluate the positive and negative effects of artificial ecosystems and be able to recognise that practical solutions to human needs may require compromise between competing priorities.
-

- Level 10
- understand the cycling of the major elements (carbon, nitrogen, oxygen) and the role of microbes and other organisms in maintaining the cycles.
 - understand predator-prey relationships in the context of managed ecosystems.
-

PROCESSES OF LIFE – ATTAINMENT TARGET 3

Pupils should develop their knowledge and understanding of the organisation of living things and of the processes which characterise their survival and reproduction.

Relevant part of the programme of study

5 to 7 Children should be finding out about themselves, developing their ideas about how they grow, feed, move and use their senses [14], [15].

Using suitable books, pictures and charts, they should be introduced to ideas about how they keep healthy [13] through exercise and personal safety. Children should be introduced to the role of drugs as medicines.

7 to 11 Children should investigate some aspects of feeding, support, movement and behaviour in relation to themselves and other animals [2].

They should be introduced to basic ideas about the processes of breathing, circulation, growth and reproduction.

They should explore ways in which good health can be promoted, using a range of secondary sources chosen by the teacher. They should be introduced to the fact that while all medicines are drugs, not all drugs are medicines; and they should begin to be aware of the catastrophic effect on health resulting from an abuse of drugs.

They should investigate the effects of physical factors on the rate of plant growth, for example, light intensity, temperature, and the amount of fertiliser [2], [9].

11 to 14 Pupils should explore and investigate how flowering plants and mammals are normally organised at cellular and macroscopic levels [2].

They should make a more detailed study of food and feeding (including digestion and assimilation), respiration, growth and reproduction, particularly as they relate to human beings [13].

They should investigate the requirements for photosynthesis in green plants and the resulting products (sugars, starch and oxygen) [2], [4].

They should have opportunities to explore and investigate the uses of enzymes and microbes for example, in the baking, brewing and dairy industries.

Through the use of a range of secondary sources, they should extend their study of ways in which the healthy functioning of the human body may be promoted or disrupted by diet, lifestyle, bacteria and viruses and the use and abuse of medicines and drugs [2]. They should study the physical and emotional factors necessary for the well-being of human beings in the early stages of their development. They should be encouraged to select appropriately from the range of information available to them.

16

Pupils should explore and investigate sensitivity, coordination and response, and should relate behaviour to survival and reproduction in plants and animals.

They should investigate plant mineral requirements; limiting factors in photosynthesis and the uses of photosynthetic products in plants. They should explore the ways in which the internal environments of plants and animals are maintained including water relations, temperature control, defence mechanisms, solute balance, for example, sugars, carbon dioxide, urea and the human embryonic environment.

They should have opportunities to consider examples of technologies used to promote, improve and sustain the quality of life. They should consider how hormones can be used to control and promote fertility, growth and development in plants and animals and be aware of the implications of such use.

They should have opportunities to consider the effects of, for example, solvents, alcohol, tobacco and other drugs on the way the human body functions. In this study they should be given opportunities to work independently or in groups to seek out, select and use reference materials and to organise the information from a range of sources and perspectives.

Statements of attainment

Pupils should:

- Level 1
- be able to name or label the external parts of the human body and plants, for example, flower, stem, trunk.
-

- Level 2
- know that living things reproduce their own kind.
 - know that personal hygiene, food, exercise and rest, keeping safe, and the proper and safe use of medicines are important.
 - be able to give a simple account of the pattern of their own day.
-

- Level 3
- know that the basic life processes: feeding, respiration, support, movement and behaviour, are common to human beings and the other animals they have studied.
 - be able to describe the main stages in the human life cycle.
-

- Level 4
- be able to name the major organs and organ systems in flowering plants and mammals.
 - understand the factors which contribute to good health and body maintenance, including the defence systems of the body, diet, oral hygiene and avoidance of harmful substances such as tobacco, alcohol and other drugs.
 - understand the process of reproduction in mammals.
 - be able to describe the main stages of flowering plant reproduction.
-

- Level 5
- know that living things are made up from different kinds of cells which carry out different jobs.
 - understand deficiency diseases and the relationships between diet, exercise, health, fitness and circulatory disorders.
 - understand the process of digestion in which food is made soluble so that it can enter the blood.
 - understand the way in which microbes and lifestyle affect health.
-

Level 6

- understand the process of respiration in which energy is transferred to enable other life processes to occur.
- know that water, light energy and carbon dioxide are needed for photosynthesis and that sugars and starch are produced and that oxygen is a by-product.
- understand the factors necessary for the well-being of young children in the early stages of their development.
- know about the physical and emotional changes that take place during adolescence and understand the need to have a responsible attitude to sexual behaviour.
- understand the risks of alcohol, solvent and drug abuse and how they affect body processes.
- understand the processes of conception in human beings.

Level 7

- be able to analyse behaviour in terms of the stimulus, receptor, coordinator and effector involved.
- know that plants require specific minerals for healthy growth and that the products of photosynthesis can be converted into a range of substances necessary for the plant.
- be able to give a basic explanation and evaluation of the impact of life-supporting technologies, for example, incubators, pacemakers, and kidney machines, in improving and sustaining the quality of life.

Level 8

- be able to describe the functions of the major organ systems and how they contribute to maintaining the internal environment in plants, animals and human embryos.
- understand that ineffective organisms and drugs can disrupt the normal functioning of the body and how the body's natural defences may be enhanced by immunisation and the use of medicines.

Level 9

- understand how environmental factors can be varied to enhance photosynthesis.
- be able to make informed judgements about the benefits and drawbacks underlying the use of hormones and growth regulators in controlling growth, development and fertility in plants and animals.

Level 10

- understand how homeostatic and metabolic processes contribute to maintaining the internal environment of organisms.
-

GENETICS AND EVOLUTION – ATTAINMENT TARGET 4

Pupils should develop their knowledge and understanding of variation and its genetic and environmental causes and the basic mechanisms of inheritance, selection and evolution.

Relevant part of the programme of study

5 to 7 Children should consider similarities and differences between themselves and other children by direct observation and through stories, books, videos and pictures.

7 to 11 Children should investigate and measure the similarities and differences between accessible plants and animals [2] and their fossil counterparts. In this study they should pay attention to the welfare and protection of living material.

11 to 14 Pupils should investigate variation between individuals in a range of living things, giving due attention to the welfare of living things. They should translate data into trends and norms and consider both genetic and environmental causes.

14 to 16 Pupils should have opportunities to measure the differences between individuals. They should consider the interaction of genetic and environmental factors (including radiation) in variation [6], [5], [8].

Using the concept of the gene, and through use of a wide range of secondary sources, they should explore the basic principles of inheritance in plants and animals and their application in the understanding of inherited diseases.

Using sources which give a range of perspectives, they should have the opportunity to consider the basic principles of genetic engineering in relation to drug and hormone production, as well as being aware of any ethical considerations that such production involves. They should explore the ideas of variability and selection leading to evolution and selective breeding and cloning.

Statements of attainment

Pupils should:

-
- Level 1
- know that living things vary from one individual to the next.
-
- Level 2
- be able to measure simple differences between each other.
-
- Level 3
- know that some life forms became extinct a long time ago and others more recently, for example the dinosaur and the marsupial wolf (Tasmanian Tiger).
-
- Level 4
- be able to measure variation in living organisms.
-
- Level 5
- know that information in the form of genes is passed on from one generation to the next.
 - know that some diseases can be inherited.
-
- Level 6
- understand the genetic and environmental causes of variation in living organisms.
-
- Level 8
- understand the principles of a monohybrid cross involving dominant and recessive alleles.
 - be able to describe examples of the inheritance of human genetic diseases.
 - understand the relationship between radiation and genetic mutation.
-
- Level 9
- understand the relationships between variation, natural selection and reproductive success in organisms and the significance of these relationships for evolution.
 - know that selective breeding produces economic benefits and contributes to improved yields in agriculture.
 - be able to describe a range of cloning methods and their uses in agriculture, and show an appreciation of the economic impact and the related ethical issues.
 - know that a gene is a section of a DNA molecule.
-

- Level 10
- be able to analyse a range of monohybrid crosses involving dominance and co-dominance.
 - understand how DNA replicates itself and controls protein synthesis by means of a base code.
 - understand the basic principles of genetic engineering in relation to drug and hormone production.
 - be able to make informed judgements about the economic, social and ethical issues concerning the recent developments in genetic engineering.
-

HUMAN INFLUENCES ON THE EARTH - ATTAINMENT TARGET 5

Pupils should develop knowledge and understanding of the ways in which human activities affect the Earth.

Relevant part of the programme of study

5 to 7 Children should investigate the extent to which a selection of everyday waste products such as garden refuse, paper, plastic materials and cans 'decay naturally' [6]. They should keep records of their observations and use this knowledge to help improve the appearance of their local environment.

7 to 11 Children should study aspects of their local environment which have been affected by human activity. These may include farming, industry, sewage disposal, mining or quarrying. Where possible this should be by first-hand observation, but secondary sources may need to be used where there are considerations of safety. They should observe and record the significant features of the process; the range and origins of any raw materials; waste disposal procedures and the usefulness of any product(s).

11 to 14 Pupils should investigate ways water resources are managed and, through use of secondary sources and first-hand practical experience, ways of monitoring water purity. They should consider the presence of soluble and insoluble materials, pH and the oxygen content of water [9], [6].

Pupils should observe the effect of corrosive gases on common metals and the ways these effects can be minimised [7].

Using secondary sources of evidence and other data, they should come to appreciate that industries require raw materials to produce beneficial products and services, and that these aspects need to be balanced against any harmful effects on the environment. They should study the effects of supply and demand on the exploitation of raw materials. They should be introduced to the classification of waste products of human activities as biodegradable or non-biodegradable.

14 to 16 Pupils should have opportunities through fieldwork, investigations and the use of secondary sources to consider current concerns about human activity including the exploitation of resources, the disposal of waste products on the Earth, in its oceans and atmosphere and the effects on climate [2], [4], [6], [7], [9]. The work should encourage pupils to use their scientific knowledge, weigh evidence and form balanced judgements bearing in mind relevant factors, including economic factors [13], [21].

Statements of attainment

Pupils should:

-
- Level 1
- know that human activities produce a wide range of waste products.
-
- Level 2
- know that some waste products decay naturally but often do so over a long period of time.
 - be able to keep a diary in a variety of forms of change over time.
-
- Level 3
- know that human activity may produce local changes in the Earth's surface, air and water.
 - be able to give an account of a project to help improve the local environment.
-
- Level 4
- know that some waste materials can be recycled.
-
- Level 5
- be able to describe the sources, implications and possible prevention of pollution.
 - be able to classify waste products as biodegradable and non-biodegradable.
 - be able to argue for and against particular planning proposals in the locality which may have an environmental impact.
-
- Level 6
- understand the processes which affect water purity.
 - understand the importance of good water management.
 - be able to identify the positive and negative effects of exploitation of raw materials, including harmful effects on the environment.
-
- Level 7
- understand the balance of advantages and disadvantages in the way human activity affects the environment.
 - know that the impact of human activity is relatively recent and understand that it is related to the size of the population, economic factors and industrial requirements.
-
- Level 8
- understand that major changes in the biosphere can result from human activity and that the time-scale for its restoration is relatively long.
-
- Level 10
- be able to select and weigh evidence to form reasoned judgements about some of the major ecological issues facing society.
-

PES AND USES OF MATERIALS - ATTAINMENT TARGET 6

Pupils should develop their knowledge and understanding of the properties of materials and the way properties of materials determine their uses and form the basis for their classification.

Relevant part of the programme of study

5 to 7 Children should collect and find similarities and differences in a variety of everyday materials, natural and manufactured, including cooking ingredients, rocks, air and water and other liquids. They should work with, and change, some of these materials by simple processes such as dissolving, squashing, pouring, bending, twisting and treating surfaces [5], [9], [13], [15].

7 to 11 Children should work with a number of different everyday materials. Using secondary sources, they should explore their origins and how some of these are used in construction. Properties such as mass, volume, strength, hardness, flexibility, compressibility and solubility should be investigated and measured [13], [14]. They should explore chemical change in a number of everyday materials, such as making plaster of Paris, making cement and firing clay. They should find out the common use of materials and relate the use to the properties which they have investigated [14]. They should learn about the dangers associated with the use of everyday materials, such as bleach and hot oil.

11 to 14 Pupils should have the opportunity to study a wider range of physical and chemical properties of everyday materials, including living materials, making measurements where possible, in order to develop their understanding of the main ways of classifying them [5].

They should investigate various techniques for separating and purifying mixtures. They should classify a number of metals and non-metals, some by direct observation and others with the help of tables of data.

14 to 16

Pupils should have the opportunity at first and second hand to consider suitable materials for use in particular practical purposes. This study should also consider the energy requirements [13] and the social, economic, environmental and health and safety factors associated with manufacturing materials [4], [5], [9].

Pupils should have the opportunity to make mixtures that have important everyday applications, and illustrate important types of mixtures (emulsions, foams, gels and solutions). They should be introduced to the idea of composite materials, illustrated by some common examples, for example, reinforced concrete, glass-reinforced plastic, bone, synthetic fibres.

They should carry out a more detailed study of selected elements in order to understand the different ways in which they can be classified [8].

The study should extend to the relationship between the properties of materials and their structures [8].

Statements of attainment

Pupils should:

- Level 1**
- be able to describe familiar and unfamiliar objects in terms of simple properties such as, for example, shape, colour, texture and describe how they behave when they are, for example, squashed and stretched.
-
- Level 2**
- be able to recognise important similarities and differences, such as hardness, flexibility and transparency, in the characteristics of materials.
 - be able to group materials according to their characteristics.
 - know that heating and cooling materials can cause them to melt or solidify or change permanently.
-
- Level 3**
- know that some materials occur naturally while many are made from raw materials.
 - be able to list the similarities and differences in a variety of everyday materials.
-
- Level 4**
- be able to make comparisons between materials on the basis of simple properties such as strength, hardness, flexibility and solubility.
 - be able to relate knowledge of these properties to the everyday use of materials.
 - know that solids and liquids have weight which can be measured and, also, occupy a definite volume which can be measured.
 - understand the process of change of state that results from heating or cooling.
 - be able to classify materials into solids, liquids and gases on the basis of their properties.
-
- Level 5**
- know that gases have weight.
 - be able to measure pH and classify aqueous solutions as acidic, alkaline or neutral.
 - be able to give an account of the various techniques for separating and purifying mixtures.
-

- Level 6**
- be able to distinguish between the main classes of materials (metals, ceramics, glass, plastics and fibres) in terms of their properties.
 - be able to describe the difference between mixtures and pure compounds.
-

- Level 7**
- understand the meaning of the following properties of materials: strength, hardness, elasticity, solubility, density, melting point, electrical and thermal conductivity.
 - be able to relate knowledge of these properties to the everyday use of materials.
 - be able to interpret data and observations in distinguishing between elements (metallic and non-metallic) and their mixtures and compounds, according to their properties.
 - understand the relationship between the volume of a gas and its pressure and temperature, in quantitative terms.
 - be able to make predictions from the reactivity series of metals.
-

- Level 8**
- be able to describe the construction of the periodic table in terms of families of elements.
 - be able to describe the important chemical properties of metals and non-metals.
-

- Level 9**
- be able to describe simple trends of properties within a periodic table group of metals and of non-metals.
 - be able to collect and use quantitative measurements of properties of materials, including cost, to make judgements about the use of different materials.
-

- Level 10**
- understand the construction of the periodic table in terms of atomic structure for important elements.
 - be able to evaluate the relative advantages of composite materials.
 - understand the limitations of systems of classification.
 - be able to use scientific knowledge and information from a range of sources to evaluate the social, economic and environmental factors associated with manufacturing a metal, ceramic, plastics or fibre.
-

● KING NEW MATERIALS - ATTAINMENT TARGET 7

Pupils should develop their knowledge and understanding of the process of changing materials by chemical reaction and the way this is used in the manufacture of new materials.

Relevant part of the programme of study

11 to 14 Pupils should participate in experiments which investigate different types of reaction such as combustion, thermal decomposition, corrosion [5], metal extraction, neutralisation, electrolysis [11], and fermentation [3], to illustrate the way in which chemical reactions lead to the formation of new materials and also involve energy changes.

They should have the opportunity to relate these reactions to information about manufacturing processes involved in metal extraction, oil fractionation and fermentation [21], through use of a range of sources.

14 to 16 Pupils should investigate the different factors that affect the rate of chemical reactions and relate these to the practical problems associated with the manufacture of materials and to everyday biochemical change, for example, food deterioration.

They should have opportunities to research the manufacturing processes involved in cracking oil, the chlor-alkali industry and the production of plastics and fertilisers [21] and to relate this research to experimental methods used in the school laboratory.

They should explore the social, economic, environmental, health and safety implications of manufacture, including the effects of changing economic conditions on the suitability of particular processes [5], [21].

The study should extend to an opportunity to relate reactions such as electrolytic decomposition, neutralisation and ionic reactions in solution to the models developed in [8].

Statements of attainment

Pupils should:

- Level 4
- know that when a chemical reaction occurs, new materials are formed.
 - know that an important feature of manufacture is the conversion of raw materials, by chemical reactions, into useful products.
-

- Level 5
- know that air, water, rocks, living things and fossil fuels are all sources of raw materials for use in manufacture.
 - understand the application of biochemical processes in manufacture, for example, in fermentation.
 - understand the processes of combustion and respiration in which fuels and oxygen combine to form oxides.
-

- Level 6
- understand the importance of reactions between acids and alkalis producing salts.
 - be able to give an account of thermal and electrolytic decompositions in some important manufacturing processes.
 - know that most chemical reactions transfer energy to the surroundings.
-

- Level 7
- understand the qualitative effect of temperature, concentration, particle size and catalysis on the rate of chemical reactions.
 - be able to relate important oxidation and reduction reactions to manufacturing processes and everyday effects such as food oxidation.
 - understand the economic implications and the causes of rusting and the ways of preventing the process.
-

- Level 8
- be able to recognise quantitative relationships in the major factors affecting rates of chemical reaction and that a practical solution may require a compromise between competing priorities, as shown by important manufacturing processes and everyday biochemical change.
 - be able to explain precipitation reactions in terms of the solubility of reactants and products and relate this to processes of purification.
-

Level 9

- be able to explain how chemicals are made from oil in terms of breaking up and joining molecules.
- be able to recognise examples of addition and condensation polymerisation and relate them to important commercial polymers, their manufacture and the economic factors involved.

Level 10

- know that the energy transferred in a chemical reaction is associated with the breaking and reforming of chemical bonds.
 - be able to explain precipitation in terms of the interaction of ions.
 - be able to predict the products of simple electrolytic reactions.
 - know that the rock cycle, driven by solar energy and the Earth's internal heat, can concentrate certain elements into ores, and that rock forming processes may produce other raw materials.
-

EXPLAINING HOW MATERIALS BEHAVE – ATTAINMENT TARGET 8

Pupils should develop their knowledge and understanding of the use of models to explain the structure and properties of materials.

Relevant part of the programme of study

11 to 14 Pupils should experience a range of familiar examples of changes of state, evaporation, diffusion and dissolving and be given opportunities to explain them in terms of their developing ideas of the particulate model of matter.

Their study should extend to an investigation of the temperature changes that occur during changes of state and to other changes, such as expansion, that occur during heating and cooling [6].

14 to 16 Pupils should investigate the kinetic theory as a model, through experiments and secondary sources, to explain changes of state and a range of other phenomena.

Using examples arising from the programme of study, they should develop models to explain the difference between elements and compounds in terms of atoms, molecules and ions.

They should have the opportunity to extend these models in order to describe the structure of the atom and the explanation these afford for radioactivity [13].

They should have opportunities, using a wide range of secondary sources, to study the effects of radioactive emissions, different methods of detecting ionising radiations and their effects on matter [4], [15], [21] and living organisms.

Pupils should have experience of the symbolic representation of these models in three-dimensional form, diagrams and equations [6], [7].

STATEMENTS OF ATTAINMENT

Pupils should:

- Level 4**
- be able to use their own ideas about the constitution of matter and relate them to everyday examples involving changes of state and solubility.
-
- Level 5**
- know that it is helpful to imagine that everything is made up of very small particles, called atoms.
-
- Level 6**
- be able to explain the difference between solids, liquids and gases in terms of proximity and motion of particles.
 - know that energy transfers are associated with changes of state and with changes within a particular state, for example, expansion.
 - be able to construct simple word equations to describe reactions.
-
- Level 7**
- be able to explain changes of state and the energy changes associated with them and, also, evaporation, diffusion and dissolving in terms of simple kinetic theory.
 - understand the difference between elements and compounds in terms of atoms and molecules, using simple examples.
 - be able to interpret the symbolic representation of models for atoms and molecules in three-dimensional form and in diagrams.
 - know that radioactive substances give out ionising radiations, some of which are present naturally as background radiation, and that these can be harmful, but also have beneficial use.
-
- Level 8**
- be able to describe the structure of the atom in terms of protons, electrons and neutrons.
 - be able to describe radioactivity and nuclear fission in terms of the atomic model.
 - be able to relate the properties of molecular and giant structures to the arrangements of atoms and ions.
 - be able to use symbolic equations qualitatively to describe reactions.
-

- Level 9
- be able to interpret chemical equations quantitatively.
 - know that there are different types of ionising radiations, each with different properties.
 - be able to give a coherent account of the properties of different types of ionising radiation.
 - be able to explain the meaning of half-life.
-

- Level 10
- be able to apply the kinetic theory in a range of contexts.
 - be able to explain electrolysis in terms of ionic reactions.
 - be able to relate the bulk properties of metals, ceramics, glass, plastics and fibres to simple models of their structures.
 - understand the significance of half-life in the use of radioactive materials.
-

EARTH AND ATMOSPHERE – ATTAINMENT TARGET 9

Pupils should develop their knowledge and understanding of the structure and main features of the Earth, the atmosphere and their changes over time.

Relevant part of the programme of study

5 to 7 Children should collect, and find differences and similarities in natural materials found in their locality, including rocks, shells and soil [6]. They should compare samples with those represented or described at second hand.

They should observe and record the changes in the weather and relate these to their everyday activities [17].

7 to 11 Children should investigate natural materials (rocks, minerals, soils), should sort them according to simple criteria, and relate them to their uses and their origins, using books and other sources. They should be aware of local distributions of some types of natural materials (sands, soils, rocks) [5], [6].

They should observe, through urban or rural fieldwork, how the weather affects natural materials [2], [3], [6], (including plants) in their surroundings and how soil develops.

They should have the opportunity to make regular, quantitative observations of the weather and the seasons of the year [2], [5], [16].

11 to 14 Pupils should investigate practically and by use of secondary sources the properties of water and the causes of its transformation from state to state [8], [13], its role in the atmosphere and oceans, and on the Earth's surface as both a landscaping agent and a resource [5], [8], [11]. They should study factors which influence the weather, including how different airstreams give different weather.

They should investigate by observation, experimentation and fieldwork, the properties and formation of igneous, metamorphic and sedimentary rocks [7], and link these to major features and changes on the Earth's surface [6], [7], [8]. They should be aware of the time-scales involved in the operation of geological processes, and be able to evaluate earlier ideas concerning the age of the Earth [4], [8], [16]. They should link the properties of minerals and rocks to their uses as raw materials [5], [6], [7].

14 to 16

Pupils should study, through laboratory and fieldwork, the evidence which reveals the mode of formation, and later deformation of rocks, and the sources of energy that drive such processes [8], [10], [13].

They should examine data that suggests that the Earth has a layered structure [14], [15], including density contrast between surface rocks and the whole Earth, transmission of Earthquake waves and the Earth's crust, and how these were changed by advances in other fields of science and technology [8], [11], [17].

They should investigate the evidence that favours the theory of plate tectonics and know that plate movements have influenced the nature of the rock record and the global distribution of the Earth's physical resources [5], [7], [13]. They should consider earlier theories concerning movements of the Earth's crust, and how these were changed by advances in other fields of science and technology [8], [11], [17].

They should study the origin of the atmosphere and the ocean and the factors which maintain atmospheric composition [2], [3], [5], [16], and make simple comparisons with other similar planets in the solar system. They should study atmospheric circulation including the qualitative relationship between pressure and winds.

● Statements of attainment

Pupils should:

- Level 1
- know that there is a variety of weather conditions and be able to describe changes in the weather.
-

- Level 2
- know that there are patterns in the weather which are related to seasonal changes.
 - know that the weather has a powerful effect on people's lives.
 - be able to record the weather over a period of time, in words, drawings and charts or other forms of communication.
 - be able to sort natural materials into broad groups according to observable features.
-

- Level 3
- understand some of the effects of weathering on buildings and on the landscape.
 - know that air is all around us.
 - understand how weathering of rocks leads to the formation of different types of local soil.
 - be able to give an account of an investigation of some natural material (rock or soil).
 - be able to understand and interpret common meteorological symbols as used in the media.
-

- Level 4
- be able to measure temperature, rainfall, wind speed and direction.
 - be able to explain that wind is air in motion.
 - be able to explain how earthquakes and volcanoes are associated with the formation of landforms.
 - know that climate determines the success of agriculture and understand the impact of occasional catastrophic events.
-

- Level 5
- know that landscapes are formed by a number of agents including Earth movements, weathering, erosion, and deposition and that these act over different time-scales.
 - be able to explain the water cycle.
-

- Level 6
- be able to explain the processes by which igneous, sedimentary and metamorphic rocks were formed and are recycled.
 - be able to describe how the properties of minerals and rocks are related to their uses as raw materials.
 - understand how different airstreams give different weather.
-

- Level 7
- be able to state qualitatively the relationship between pressure and winds.
 - be able to recognise patterns in the distribution of the Earth's major surface features (continents, mountain belts, areas of very old rock, oceans, ocean basins, trenches and ridges) and zones of active crust (earthquakes and volcanoes).
-

- Level 8
- understand the nature of geological time and the ways in which it can be measured.
 - be able to interpret evidence of modes of formation and deformation of rocks.
-

- Level 9
- be able to use appropriate scientific ideas to explain the workings of the atmosphere and the development of various weather phenomena.
 - be able to describe in simple terms the layered structure of the inner Earth, and explain the evidence that favours such a model (density contrast between surface rocks and the whole Earth, transmission of earthquake waves, the Earth's magnetic field).
-

- Level 10
- understand the theory of plate tectonics and use it to explain many of the geological features on the Earth's surface.
 - understand how plate tectonic theory brought about a revolution in our understanding of the way the outer part of the solid Earth works.
-

FORCES – ATTAINMENT TARGET 10

Pupils should develop their knowledge and understanding of forces; their nature, significance and effects on the movement of objects.

Relevant part of the programme of study

5 to 7 In the context of classroom and outdoor play activities, children should experience natural and manufactured forces which push, pull, make things move, stop things and change the shape of objects. Such experiences could include, for example, road safety activities [11].

7 to 11 Children should use measurements to compare the effects of forces in the context of, for example, bridge building. They should investigate the strength of shapes and structures.

They should experience the forces involved in floating and sinking. They should explore the forces which cause movement. This work should be set in everyday contexts such as transport (including cycling and sailing), balancing systems and hydraulic mechanisms in model making [9].

11 to 14 Pupils should investigate the factors involved in producing and maintaining motion. This work should make reference to friction and be set in the context of human and vehicular movement with particular reference to road safety. Their investigation should include the measurement of speed.

14 to 16 In the context of familiar situations, including road transport, sport and space travel, pupils should investigate the effects of forces on motion. They should explore examples of motion including free fall and circular motion, the movement of projectiles and the effect of friction. They should consider the use of ideas of momentum and energy in relation to the motion of systems, for example, in collisions, rockets and jet propulsion [16]. They should experience everyday applications of hydraulics.

Pupils should also investigate at first hand and through the use of secondary sources, the relationship between forces and their effects in the context of the properties of common materials and the way these determine the design and testing of relevant artefacts and structures [6].

Statements of attainment

Pupils should:

- Level 2
- understand that pushes and pulls can make things start moving, speed up or swerve.
-

- Level 3
- understand that when things are changed in shape, begin to move or stop moving, then forces are acting on them.
-

- Level 4
- understand that the movement of an object depends on the size and direction of the forces exerted on it, for example, in the context of investigations with elastic and wind-powered models.
 - understand that the greater the speed of an object the greater the force and/or time that is needed to stop it and understand the significance of this for road safety.
 - understand that things fall because of a force of attraction towards the centre of the Earth.
 - be able to recognise weight as a force, measured in newtons.
-

- Level 5
- understand that when an object is not moving relative to its environment, or when it is moving at steady speed without change of direction, there are balanced forces acting upon it, for example, a car stood at rest on the surface of the Earth.
 - be able to give account of the investigation of the strength of a structure.
 - be able to measure forces, distance and time.
 - be able to describe the effect of friction on moving objects.
-

- Level 6
- be able to calculate speed from direct measurements of distance and time.
 - understand the relationship between an applied force and pressure.
 - understand that the effect of a turning force depends on where it is applied in relation to a pivot and its line of action.
-

- Level 7
- be able to give simple qualitative explanations of the effects in everyday situations involving force, pressure, friction, mass, speed and acceleration.
 - be able to evaluate the design of a structure or artefact by balancing considerations of strength, choice of material and cost.
-

- Level 9
- understand and apply the mathematical relationship between force, mass and acceleration.
 - understand the concept of centre of mass and apply it in practical circumstances.
 - understand the difference between mass and weight, and between potential and kinetic energy.
-

- Level 10
- be able to recognise the interrelatedness of the ideas given in level 9 and apply them quantitatively in new situations.
 - understand the concept of momentum (and how it differs from energy).
 - understand qualitatively, that circular motion requires a centripetal force.
 - be able to determine the relationships between forces and their effects when testing a structure or artefact.
-

ELECTRICITY AND MAGNETISM - ATTAINMENT TARGET 11

Pupils should develop their knowledge and understanding of electric and electromagnetic effects in simple circuits, electric devices and domestic appliances.

Relevant part of the programme of study

5 to 7 Children should experience play activities with a variety of magnetic materials and investigate their effects on a range of materials and for a variety of uses. They should explore the Earth's magnetic field using a compass. They should experience simple activities using bulbs, buzzers, batteries and wires.

7 to 11 Children should have the opportunity to construct simple circuits and investigate the effects of using different components and materials in these circuits. They should learn how to record the construction details of a circuit by drawings and diagrams. They should learn about the dangers associated with the use of mains electricity through research of appropriate sources.

11 to 14 Pupils should investigate a wider range of electrical components in electrical circuits and investigate the effects of electric currents [7].

They should be provided with opportunities to investigate and test their ideas about the nature of electric charge and electric circuits.

They should be introduced to an interpretation of common electrostatic effects and experience activities linking flow of charge to electric current.

Pupils should investigate qualitatively the properties of magnets and electromagnets and the nature of electric and magnetic fields. Their investigation should be made in the context of everyday applications and devices such as electric motors, dynamos, compasses, transformers, sparks, loudspeakers and fuses. They should plot the Earth's magnetic field in the locality of the school.

In the context of the domestic environment, pupils should study the use of electricity for the transfer of energy, the measurement of energy transferred, and its relation to costs of using common domestic devices [13]. Such work should also develop an understanding of the standard features and procedures to protect the users of electrical equipment.

The methods by which electricity is distributed on a national scale should be introduced through visits or videos and practical work with transformers and alternating current [13].

Pupils should be given an opportunity to study electric circuits in a more quantitative way. They should be introduced to the measurements of voltage, current, electrical resistance, energy transferred electrical power, and to the relationships between these quantities.

The study should extend to cover the flow of electrons in a circuit, thermionic emission and its application in cathode ray tubes and the production of x-rays.

Statements of attainment

Pupils should:

- Level 2
- know that magnets attract certain materials but not others and can repel each other.
 - understand the dangers associated with the use of electricity, and appropriate safety measures.
-

- Level 3
- know that some materials conduct electricity well while others do not.
 - understand that a complete circuit is needed for an electrical device, such as a bulb, to work.
-

- Level 5
- be able to construct simple electrical circuits and record the circuit in diagrams.
 - be able to measure and control the flow of charge in a simple circuit.
 - understand the term voltage and be able to measure the potential difference across a conductor, such as a bulb, buzzer or heating element.
 - be able to recognise and understand the applications of the heating and magnetic effects of an electric current.
-

- Level 6
- understand how electrostatic charge generated in everyday contexts can be safely discharged.
 - understand the magnetic effect of an electric current and electromagnetic induction.
 - be able to recognise and explain simple electromagnetic effects in a range of common devices.
 - be able to measure and cost domestic electrical energy consumption by obtaining the electric meter readings.
-

- Level 7
- understand the chemical effects of an electric current.
 - be able to interpret common electrostatic phenomena in terms of unbalanced charges.
-

Level 8

- be able to conduct simple investigations with ammeters, voltmeters and joulemeters to measure quantities such as electrical resistance and the energy dissipated in a device.
- be able to explain how electricity is distributed on a national scale.
- understand the behaviour of a circuit and its components in terms of a model of charge flow.

Level 9

- be able to express the relationships between the following quantities in the appropriate units: charge, current, voltage, resistance and electrical power.
- be able to measure these electrical quantities.
- be able to make informed judgements about the economic and environmental benefits and drawbacks associated with the different methods of generating electricity.

Level 10

- be able to explain thermionic emission and the production of x-rays and cathode rays.
 - be able to explain the use of x-rays, recognising that applications require compromise between competing priorities.
-

THE SCIENTIFIC ASPECTS OF INFORMATION TECHNOLOGY INCLUDING MICROELECTRONICS – ATTAINMENT TARGET 12

Pupils should develop their knowledge and understanding of information transfer and microelectronics.

Relevant part of the programme of study

5 to 7 Children's normal work in all areas should involve, where appropriate, the use of information sources, using, for example, computers, tape recorders and television to broaden their experience of science.

7 to 11 Children should have the opportunity to use and investigate the transmission and storage of information using computers, sensors and the telephone. Children should use these in experiments and to store, retrieve and present their work.

11 to 14 Pupils should experiment with circuits containing sensors activated by a variety of environmental factors such as temperature, light, moisture, tilt, pressure and magnetic field.

Using a systems approach, pupils should have an opportunity to use logic gates as simple two-state switching circuits together with input sensors and output devices, in simple decision making and control circuits.

The should have the opportunity to develop skills in the use of computers to store and process information and to control and collect data during experiments.

14 to 16 Pupils should investigate the behaviour of a bistable circuit made from two logic gates. They should consider its role as a simple memory circuit and use monostables and bistables to perform useful tasks.

Through the use of secondary sources and by direct investigations, pupils should consider the common features underlying various communication systems in the context of everyday applications. They should consider some of the economic factors associated with different communication systems [21].

Pupils should study the methods of coding, transmitting and storing information in a range of systems including, biological, mechanical, optical and electronic [14], [15].

During their study of science, pupils should have the opportunity to use information technology to gather and display data from experiments, to simulate physical, biological and chemical systems and their behaviour, to access and organise data relevant to their study of science, and to use programmable systems to control external electronic, electrical or mechanical devices.

Statements of attainment

Pupils should:

- Level 2
- know that there is a variety of means for communicating information over long distances.
 - know that information can be stored on a range of everyday devices and on the computer.
-

- Level 3
- be able to store information using devices such as a tape recorder, and a digital clock.
 - know that information can be stored electronically in a variety of ways, such as text, number, pictures, sound.
 - be able to retrieve and select text, number, sound or graphics stored on a computer.
-

- Level 4
- understand the range of uses of microelectronic devices in everyday life.
 - be able to detect and measure environmental changes using a variety of instruments.
-

- Level 5
- understand the use of switches and relays in simple circuits.
 - understand logic gates and their use in decision making and simple control circuits.
-

- Level 6
- understand the differences between analogue and digital signals and instruments.
 - understand the uses of a range of devices for handling information and communication.
-

- Level 7
- be able to recognise the main features of an information-transmission system.
 - be able to use monostable and bistable circuits.
 - be able to use IT devices to monitor and control experiments.
-

- Level 8
- be able to explain the significance and operation of modern communication devices in the transmission of large amounts of information over long distances, including satellites.
 - be able to select and group the common features underlying various communication systems and interpret the economic and social implications.
 - be able to design solutions to problems using electronic systems.
-

- Level 9
- be able to recognise the effects of feedback in a control system.
 - be able to interpret electronic measurements and processed data to check their plausibility.
-

- Level 10
- understand and be able to discuss the implications of information and control technology for everyday life.
 - be able to select an appropriate piece of data management software to perform a particular task in data storage and retrieval related to an experiment and extended study.
-

ENERGY – ATTAINMENT TARGET 13

Pupils develop their knowledge and understanding of the nature of energy, its transfer and control.

They should develop their knowledge and understanding of the range of energy sources and the issues involved in their exploitation.

Relevant part of the programme of study

5 to 7 Children should consider the foods they eat and why they eat them [3]. They should talk, or communicate by other appropriate means about what they eat and why and when they eat.

They should have early experiences with devices, such as toys, which move and store energy [13].

Children should explore the effect of heating common, everyday substances such as ice, water, wax and chocolate, in order to come to an understanding of the role of heating and cooling in bringing about melting and solidifying [6].

They should begin to link the feeling of hot and cold, for example, water, bodies or air with temperature measured by a thermometer.

7 to 11 Children should investigate changes that occur when familiar substances are heated and cooled [6].

They should investigate a variety of devices which are self-propelled and which can store energy, for example, in rubber bands, springs and balloons.

Through the use of first-hand methods and secondary sources, children should investigate the range of fuels (energy sources) used in their home or school and where these fuels come from.

11 to 14 Pupils should investigate the effectiveness of simple machines and tools and how they can be used to solve everyday practical problems. Through this work, they should be introduced to the principle of energy conservation.

Pupils should have experience of a wide range of processes involving energy transfer in both domestic contexts and in familiar devices. They should be introduced to the idea that useful energy decreases. The joule should be introduced, without derivation, as a unit for the measurement of energy.

They should discuss the use of fuel/oxygen systems as concentrated sources of energy, in living things and in engines, heating systems and other devices used by humans [13].

Through the use of a range of resource materials, pupils should survey national and global sources of energy. They should consider the importance of energy from the Sun [3], nuclear energy, the origin and accumulation of fossil fuels and the use of biomass as a fuel.

14 to 16 Pupils should investigate the relationship between forces and devices used for doing work including the human body.

Pupils should have opportunities to investigate the way energy is transferred in a variety of personal and practical contexts. These investigations should include the transfer by conduction, convection and radiation particularly in domestic contexts through experimentation and reference to secondary sources.

They should be introduced to the ideas of efficiency of energy transfer and of power [11].

Through the examination of data relating to the lifetimes of resources, pupils should understand that fossil fuel resources are limited. They should have opportunities to consider the longer-term implications of the world-wide patterns of distribution and use of energy resources [5].

Pupils should be introduced to the ways electricity is generated in power stations from a range of sources both renewable and non-renewable [11]. By the use of secondary sources, pupils should consider the economic and environmental implications of using particular energy sources. This study should include reference to the Greenhouse Effect. They should be given opportunities to discuss the ways in which society comes to decisions concerning sources [5], [21].

Statements of attainment

Pupils should:

- Level 1**
- understand that they need food to be active.
 - be able to describe by talking, or other appropriate means, about food as necessary for life.
-
- Level 2**
- understand the meaning of 'hot' and 'cold' relative to the temperature of their own bodies.
 - be able to describe how a toy which moves and stores energy works.
-
- Level 3**
- understand, in qualitative terms, that models and machines need a source of energy in order to work.
 - know that the temperature is a measure of the degree of hotness (or coldness).
 - be able to use simple power sources (electric motors, rubber bands) and devices which transfer energy (gears, belts, levers).
-
- Level 4**
- understand that energy is essential to every aspect of human life and activity.
 - know that there is a range of fuels which can be used to provide energy.
 - understand that energy can be stored, and transferred to and from moving things.
 - be able to measure temperature using a thermometer.
 - be able to give an account of changes that occur when familiar substances are heated and cooled.
-
- Level 5**
- understand the need for fuel economy and efficiency.
 - understand the idea of global energy resources and appreciate that these resources are limited.
-

- Level 6
- be able to recognise different types of energy source and follow some processes of energy transfer in terms of the principle of conservation of energy.
 - understand that energy is conserved, but spread around and so is less useful.
 - be able to explain the factors which make machines, for example, pulleys, levers, useful in everyday life.
 - understand that the Sun is ultimately the major energy source for the Earth.
-

- Level 7
- understand energy transfer by conduction, convection and radiation in solids, liquids and gases and the methods of controlling these transfers, particularly of insulation in domestic and everyday contexts.
 - know that efficiency is a measure of how much energy is transferred in an intended way.
 - be able to evaluate the methods used to reduce energy consumption in the home.
-

- Level 8
- understand that the ultimate result of energy transfers is to change the temperature of the surroundings and that useful energy is dissipated.
 - understand that the use of any energy resource involves both economic and environmental costs, and that such costs may differ in nature and magnitude, depending on the energy source involved.
 - be able to describe in outline how electricity is generated in power stations from different energy sources including fossil fuels, nuclear fuels and renewable energy sources.
-

- Level 9
- be able to use the relationships between force, distance, work, energy and time, to describe, explain and compare the functioning of everyday devices.
-

- Level 10
- be able to demonstrate the application of the principle of conservation of energy, and to explain energy transfers in terms of this principle.
 - be able to evaluate the various costs and benefits of different energy sources and appreciate that society needs to take these into account before making appropriate decisions on policy.
-

SOUND AND MUSIC - ATTAINMENT TARGET 14

Pupils should develop their knowledge and understanding of the properties, transmission and absorption of sound.

Relevant part of the programme of study

5 to 7 Children should have the opportunity to experience a range of sounds in their immediate environment and to find out about their causes and uses [3].

They should investigate ways of making and experiencing sounds by vocalising and striking, plucking, shaking, scraping and blowing, for example, using familiar objects and simple musical instruments from a variety of cultural traditions. Children should explore various ways of sorting these sounds and instruments.

7 to 11 Children should explore the changes in pitch, loudness and timbre of a sound by changing, for example, the length, thickness or material of a vibrating object [6], and through changing ways of causing sound, for example, different mallets, overblowing.

11 to 14 Through access to a range of sources of information, pupils should study the way the ear works, common defects of hearing, the effects of loud sounds on the ear and the control of noise and sound levels in the environment [2]. They should have opportunities to investigate the audible range.

Pupils should investigate the effect on sound of the shape and materials of the built environment, for example, reverberation times and insulation rates.

14 to 16 Pupils should explore sound in terms of wave motion and its frequency. They should have opportunities to develop their understanding of the properties and behaviour of sound by developing a wave model, for example through observations of waves on springs and water. This should be related to pupils' experience of sounds and musical instruments, acoustic and electronic instruments and recording and synthesising.

They should be given the opportunity to investigate devices such as microphones and loudspeakers which act as transducers and be introduced to the mechanisms underlying various communications systems (telephone, radio) on which a complex society depends [12].

Pupils should investigate the characteristics and effects of vibration, including resonance, in a range of mechanical systems.

Statements of attainment

Pupils should:

- Level 2
- know that sounds can be made in a variety of ways and are heard when the sound reaches the ear.
 - be able to explain how musical notes are produced in simple musical instruments.
-
- Level 3
- know that sounds are produced by vibrating objects and can travel through different materials.
 - be able to give an account of the way in which sound is generated and can travel through different materials.
-
- Level 5
- understand the relationship between the pitch of a sound and the frequency of vibration of the source.
 - understand the relationship between the loudness of a sound and the amplitude of vibration of the source.
 - know that it takes time for sound to travel.
 - understand the importance of noise control in the environment.
-
- Level 6
- know that when sound waves travel from one point to another they transfer energy through the medium.
 - be able to explain the working of the human ear and some common defects in hearing.
 - be able to give detailed descriptions of the working of devices such as the microphone, loudspeaker and telephone.
-
- Level 7
- know that sound waves can be converted into electrical oscillations, transmitted (as electrical, optical or radio signals) over long distances and converted into sound waves again.
-
- Level 8
- know that a vibrating object has a fundamental characteristic frequency of vibration, and that some systems produce resonant oscillations which can be advantageous or disadvantageous.
-
- Level 9
- understand the impact which complex communication systems have had on cultural life and on society.
-
- Level 10
- be able to apply a knowledge of wave properties to explain common sound phenomena.
-

● **ING LIGHT AND ELECTROMAGNETIC RADIATION - ATTAINMENT TARGET 15**

Pupils should develop their knowledge and understanding of the properties and behaviour of light and electromagnetic waves.

Relevant part of the programme of study

5 to 7 Children should have opportunities to explore a variety of light sources and effects related to shadows, reflection and colour [3], [6].

7 to 11 Children should explore light passing through different transparent objects, for example, lenses, water, prisms.

Children should carry out investigations on shadows and the formation of images in mirrors and other devices.

Children should represent in drawings and diagrams their ideas about how light behaves.

11 to 14 Pupils should have opportunities to communicate their ideas and use a range of sources to explore the nature of vision, leading to an appreciation that vision occurs because light enters the eye and signals are interpreted by the brain.

Pupils should study the behaviour of light particularly absorption, reflection, refraction and colour formation. They should have opportunities to appreciate the ways light is controlled and used in a range of common optical devices, for example, mirrors, simple camera, projector, fibre optics. Through the use of a range of sources, they should study the function of the eye, extending to common defects and their correction.

14 to 16 Through a variety of approaches, including experimentation and the study of secondary sources, pupils should investigate the electromagnetic family of waves, their uses and their potential dangers in

- domestic situations (microwaves, infra-red, ultra violet);
 - communication (radio, microwaves, light) [12];
 - medicine (x-rays and gamma rays) [8].
-

Statements of attainment

Pupils should:

- Level 1
- know that light comes from different sources.
 - be able to discriminate between colours and match them or, where appropriate, demonstrate an understanding of colour in the environment.
-
- Level 2
- know that light passes through some materials and not others, and that when it does not, shadows are formed.
 - be able to draw pictures, for example, to show light, colour and shade.
-
- Level 3
- know that light can be made to change direction and shiny surfaces can form images.
 - be able to give an account of an investigation with mirrors.
-
- Level 4
- know that we see objects because light is scattered off them.
 - know that light travels in straight lines and use this to explain the shapes and sizes of shadows.
-
- Level 5
- be able to give a coherent account of the structure and function of the eye.
 - understand the process of reflection of light and the direction in which it takes place.
-
- Level 6
- understand the processes of refraction and dispersion of light by a prism and the effect produced by convex and concave lenses.
 - understand the principles of the common defects of sight and their correction.
-
- Level 7
- understand the wave nature of electromagnetic radiation.
 - know that there are many types of electromagnetic radiation that they are important in everyday life and be able to describe some of their applications.
 - be able to explain how a wide range of optical devices work, for example, simple camera, projector and optical fibre.
-

- Level 8 • understand refraction as an effect of differences of velocities in different media.
-

- Level 9 • understand the processes of dispersion, interference, diffraction and polarisation of light.
-

- Level 10 • know that the electromagnetic spectrum forms a continuum of radiation with differing physiological effects.
- be able to select, summarise and present information concerning the application of electromagnetic waves in domestic contexts, communication and medicine.
-

THE EARTH IN SPACE – ATTAINMENT TARGET 16

Pupils should develop their knowledge and understanding of the relative positions and movement of the Earth, Moon, Sun and solar system within the universe.

Relevant part of the programme of study

5 to 7 Children should observe closely their local natural environment to detect seasonal changes, including day length, weather and changes in plants and animals and relate these changes to the passage of time. They should observe, over a period of time, the length of the day, the position of the Sun, and where possible, the Moon, in the sky [9], [13].

7 to 11 Children should be given the opportunity to investigate changes in the night sky, in particular the position of the Moon, both through direct observation and by using secondary sources.

Children should use a simple model of the solar system to attempt explanations of day and night, year length and changes in the aspect of the Moon [2], [9].

11 to 14 Pupils should further develop their study of the solar system both by direct naked eye observation and the use of secondary sources. They should consider changes of day length and seasonal changes, ideas about the position of the Sun and planets within the solar system, and the position of the solar system in the Universe. They should study the extent of human exploration of space.

14 to 16 Pupils should have opportunities to use the idea of gravitational force to explain the movement and positions of the Earth, Moon, Sun, planets and other bodies in the universe. The idea of gravitational force should also be applied to tides and satellites. Pupils should consider the possibilities and limitations of space travel [10], using understanding gained through discussion of information from a variety of sources.

Pupils should use a variety of secondary sources to collect and discuss ideas that have been used, historically and more recently, to explain the character and origin of the Earth, other local planets, stars and the universe itself [17].

Statements of attainment

Pupils should:

- Level 1
- be able to describe through talking, or other appropriate means, the seasonal changes that occur in the weather and in living things.
 - be able to describe, in relation to their home or school, the apparent daily motion of the Sun across the sky.
 - be able to explain why night occurs.

-
- Level 2
- know that day length changes throughout the year.
 - know that the altitude of the Sun in the sky changes during the year.
 - be able to measure time with a sundial.
 - understand that we live on a large, spherical, self-contained planet, called Earth.
 - understand that the Earth, Moon and Sun are separate bodies.

-
- Level 4
- know that the phases of the Moon change in a regular and predictable manner.
 - know that the solar system is made up of the Sun and planets, and have an idea of its scale.
 - understand that the Sun is a star.

-
- Level 5
- be able to relate a simple model of the solar system to day/night and year length, changes of day length, seasonal changes and changes in the altitude of the Sun.
 - be able to observe and record the shape and surface shading of the Moon over a period of time.

-
- Level 6
- be able to describe, using relevant scientific language, how the Earth, Moon, Sun, and planets move relative to one another.
 - be able to explain that the solar system forms part of a galaxy which is part of a larger system called the universe, and that the position and nature of the component parts of the universe change over long time-scales.
 - be able to argue that the Earth is not flat.
 - understand that gravity acts towards the centre of every astronomical body.
-

- Level 8
- know that gravity acts between all masses and the magnitude of the force weakens with distance.
 - be able to use data on the solar system or other stars to speculate on the conditions on other planets.
 - know that other planets may be geologically active and that their initial composition was determined by their distance from the Sun.
-

- Level 9
- be able to relate the idea of gravitational force to the behaviour of the tides, the motion of planets and satellites, and the possibilities and limitations of space travel.
 - understand that the Sun is powered by nuclear processes.
 - know that variations in Solar energy reaching the Earth affect its climate.
-

- Level 10
- be able to relate current theories of the origin of the Earth and the universe to those of the past and those used in other cultures.
 - understand that gravity is responsible for the collapse of stars and the decreasing rate of expansion of the universe.
-

● NATURE OF SCIENCE – ATTAINMENT TARGET 17

Pupils should develop their knowledge and understanding of the ways in which scientific ideas change through time and how the nature of these ideas and the uses to which they are put are affected by the social, moral, spiritual and cultural contexts in which they are developed.

Relevant part of the programme of study

11 to 14 Through their own investigations and the use of text, film, other secondary sources, and through case studies, for example, work focused on the life and work of a famous scientist and/or the development of an important idea in science, pupils should be given opportunities to:

- study the ideas and theories used in other times to explain natural phenomena;
- relate such ideas and theories to present scientific and technological understanding and knowledge;
- compare such ideas and theories with their own emerging understanding and relate them to available evidence.

14 to 16 Pupils should continue the programme of study outlined above, but in addition they should also:

- distinguish between claims and arguments based on scientific data and evidence and those which are not;
 - consider how the development of a particular scientific idea or theory relates to its historical and cultural, including the spiritual and moral, context;
 - study examples of scientific controversies and the ways in which scientific ideas have changed.
-

Statements of attainment

Pupils should:

- Level 4
- be able to describe the story of some scientific advance, for example, in the context of medicine, agriculture, industry or engineering, describing the new ideas and investigation or invention and the life and times of the principal scientist involved.
-
- Level 5
- be able to discuss clearly with others their way of thinking about some experiment which is new to them.
 - be able to demonstrate that different interpretations of the experimental evidence that they have collected are possible.
-
- Level 6
- be able to use one or two explanatory models from their own learning in science to demonstrate how predictions have been made which stimulate new experiments.
 - be able to describe and explain one incident from the history of science where successful predictions were made to establish a new model. For example, the work of scientists on:
 - the work on air-borne organisms (Pasteur)
 - the evidence for atmospheric pressure (Pascal)
 - the gaps in the periodic table (Mendeleev)
-
- Level 7
- be able to give an historical account of a change in accepted theory or explanation and demonstrate an understanding of its effects on people's lives – physically, socially, spiritually, morally. For example, understanding the ecological balance and the greater concern for our environment; the observations of the motion of Jupiter's moons and Galileo's dispute with the Church.
 - be able to demonstrate an appreciation of differing functions of scientific evidence and imaginative thought in carrying forward scientific understanding. For example, discovery of the structure of DNA – the different approach of Franklin to that of Watson and Crick.
-
- Level 8
- be able to explain how a scientific explanation from a different culture or a different time contributes to our present understanding. For example: holistic medicine, evolutionary theory.
-

Level 9

- be able to distinguish between generalisations and predictive theories and give an example of each. For example, such pairs might be:

'all metals conduct electricity' and 'the theory of a free electron gas which predicts this property'

OR

'a clear sky in winter always means frost at night' and 'the absence of clouds to reflect back the Earth's radiation is the basis of such a prediction'.

Level 10

- be able to demonstrate an understanding of the differences in scientific opinion on some topic, either from the past or present, drawn from studying the relevant literature. For example, plate tectonics and the wrinkling of a shrinking Earth OR living things reproduce their own kind and spontaneous generation of species.
 - be able to relate differences of scientific opinion to the uncertain nature of scientific evidence. For example, what is the cause of 'cot deaths' OR what is responsible for the death of trees in European forests?
-

8. SCIENCE FOR AGES 5-16: SUMMARY OF COUNCIL'S RECOMMENDATIONS AND ADVICE

Recommendations

- 8.1 The curriculum for science should apply to all pupils without modification, with every effort being made to facilitate access for all pupils including those with a statement of special educational need made under the 1981 Act (para. 3.3).
- 8.2 Draft Orders, having taken account of consultation responses, should consist of 17 attainment targets. For reporting purposes the attainment targets should be grouped in two profile components: Exploration of Science (attainment target 1) and Knowledge and Understanding of Science (attainment targets 2-17) (paras 4.1 and 4.11).
- 8.3 The attainment target called *Exploration of Science* should be located in draft Orders as attainment target 1, with the targets for knowledge and understanding being attainment targets 2-17, inclusive (para. 4.12).
- 8.4 The attainment targets concerned with *communication* should be incorporated into attainment targets 1-17, see Appendix D for details (paras 4.5-4.7).
- 8.5 The attainment targets concerned with *science in action* should be incorporated into attainment targets 2-17, see Appendix E for details (paras 4.8-4.10).
- 8.6 **Weighting.** The weighting of profile components should be:

Key stage	1	2	3	4
<i>Exploration of Science</i>	50	45	35	30
<i>Knowledge and Understanding of Science</i>	50	55	65	70

(para. 4.12)

- 8.7 The study of all 17 attainment targets for science will be required, excepting for those pursuing the alternative course in key stage 4 (para. 4.13).
- 8.8 Council believes that the whole programme of study will best secure the educational objectives for science in the National Curriculum, through achievement in all 17 attainment targets. It recommends that the Secretary of State should encourage schools to ensure that the majority of pupils follow such a programme in key stage 4. However, Council recommends that an alternative



FILE

DA

to BG.

10 DOWNING STREET

LONDON SW1A 2AA

From the Private Secretary

5 December 1988

Dear David,

SELF GOVERNING SCHOOLS IN SCOTLAND

Further to my letter of 30 November, the Prime Minister has now seen Tom Jeffery's letter to you dated 2 December. The Prime Minister is not persuaded by the Secretary of State for Education's argument that the arrangements for bringing primary schools into the ambit for self-governing status need to be identical to the current arrangements in England and Wales, and remains content with your Secretary of State's proposal to bring all primary schools in Scotland into the ambit.

I am copying this letter to the Private Secretaries to other members of E(EP), Alan Maxwell (Lord Advocate's Office) and Trevor Woolley (Cabinet Office).

Yan;
Pd

(PAUL GRAY)

David Crawley, Esq.,
Scottish Office.

CONFIDENTIAL

SPU



ELIZABETH HOUSE
YORK ROAD
LONDON SE1 7PH
01-934 9000

Prime Minister
On X, Brian thinks
it unreasonable for
K. Baker to try to restrict
the Scottish proposals. Agree,
to support the Rufford line?
Yes
Peace
etc

David Crawley Esq
Private Secretary
Scottish Office
Whitehall
LONDON
SW1A 2AU

2 December 1988

Dear David

SELF GOVERNING SCHOOLS IN SCOTLAND

My Secretary of State has seen the paper attached to your letter of 29 November to Paul Gray.

He is content with the proposed consultation paper except on one point. He is concerned that the proposal to bring all primary schools in Scotland into the ambit for self governing status immediately may bring into question the current arrangements in England and Wales which limit eligibility for grant-maintained status to primary schools with 300 or more pupils. Although he has power to extend eligibility in England by Order, he would not wish to do so until there is evidence of the successful running of larger grant-maintained schools and of progress of local management of smaller primary schools within the local education authority sector. He would prefer the Scottish proposals to parallel the English arrangements in this respect.

Your letter mentioned the difficulties which had arisen in England over property transfer in Tameside LEA. The authority has sold the freehold of two of its schools which are considering grant-maintained status to a private company which rents the properties back to the schools. It did so just before the decisions at the schools which triggered the provisions in the Education Reform Act for an assets freeze, and so was not prevented by these provisions. We have no evidence that any other authority in England is intending to follow suit, and my Secretary of State is therefore not seeking urgent legislation on this point in England although he may wish to amend the legislation if a suitable opportunity arises. However he agrees that it is sensible to take account of the experience in England in forming the assets provisions for Scotland.

Copies of this letter go to Paul Gray and to other recipients of your letter.

Yours etc,

Tom.

T B JEFFERY
Private Secretary

CONFIDENTIAL



LCB

*NBM
HAG
1/12*

Treasury Chambers, Parliament Street, SW1P 3AG

David Crawley Esq
Private Secretary to the
Secretary of State for Scotland
Scottish Office
Dover House
London
SW1A 2AU

1 December 1988

Dear David

below

SELF-GOVERNING SCHOOLS IN SCOTLAND

Your letter of 29 November to Paul Gray covered a draft paper, for publication next week, on "Self-Governing Schools: Extending Choice for Scottish Parents".

The Chief Secretary is broadly content with the substance of the draft, including the proposed retrospective powers over transfer of property to which you drew particular attention. He thinks, however, that the funding regime for self-governing schools should be explained, at least briefly, in the main body of the paper rather than being entirely relegated, as now, to the annex. He suggests a new paragraph, after the existing paragraph 7 of the paper, as follows:

Funding of self-governing schools

to be

Self-governing schools, although under independent local management, will be funded by the Secretary of State; they will not be able to charge fees. The level of grant for running costs will be determined so that an individual self-governing school will be no worse-off, but neither any better-off, than it could reasonably have expected, if it had remained under local authority management. The full amount of grant for running costs paid by the Secretary of State to each self-governing school will be recovered from the appropriate local education authority. Capital costs for agreed projects at self-governing schools will be met in full by the Secretary of State, after taking account of any proceeds from agreed disposals of school property."

This will require some consequential amendments to section 1 of the annex, on Government grants. That section could also usefully be sharpened-up; I enclose a redraft. I understand that these amendments have been discussed between our departments.

... I am sending copies of this letter and its enclosure to Paul Gray at (No.10), and to the Private Secretaries to other members of E(EP), Alan Maxwell (Lord Advocate's Department) and Trevor Woolley (Cabinet Office)

*Your ever
Cairns*

MISS C EVANS
Private Secretary

REVISED SECTION 7: GOVERNMENT GRANTS

Grants to a self-governing school for running costs will cover all those items appropriate to the costs of an individual education authority school including salaries, superannuation and other employment costs, purchase of equipment, books, stationery, examination fees, rates, heating and lighting for the property. It will also take account of a school's share of central spending by an authority on managing its schools, including general administration, personnel services, purchase of vehicles, advisory and other specialist support services to schools and a rolling programme of school maintenance. Self-governing schools will have to arrange their own provision for such services, perhaps negotiating with the authority for continued access to them on a repayment basis. Where an authority or other body has a protected right to use school property, the Board of Management would be able to levy a charge for, eg heating and supervision costs.

The grant for running costs to a self-governing school will be based on the funding which its education authority could have been expected to provide for the school had it remained under local authority management, taking account of the numbers of pupils at the school. The introduction of school boards will oblige education authorities to provide a detailed breakdown of spending for all schools. This breakdown will be used, where appropriate, to determine grant for running costs to a self-governing school. If an authority's own arrangements for allocation of resources do not offer a ready mechanism for determining that grant, ^{it} will be calculated by reference to recent actual levels of spending in the school and overall levels of spending on schools by the authority.

In the case of approved capital expenditure on a self-governing school after its transfer, the costs will be met in full by capital grant paid by the Secretary of State. Schools will have to seek approval for projects within the total of resources available for capital spending on schools generally. Account will be taken of the proceeds from agreed disposals of school property in fixing the amount of capital grant. The Board of Management will have no power to raise money by borrowing on school property.

The Board of Management will be able to accept legacies, donations and funds raised on behalf of the school. Administration of existing endowments specifically for the benefit of the school will transfer from the education authority to the Managers. The school will continue to be entitled to share in the proceeds of any endowments held by the education authority for the support of public education generally in the area.



PART 19 ends:-

Pg to settled office 30.11.88

PART 20 begins:-

CIF's office to settled office 1.12.88

