

Paper for Discussion

Curriculum for The Ten-Year School

An Approach Paper



National Council of Educational Research and Training

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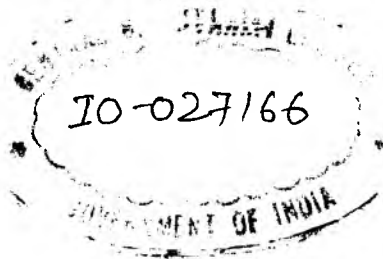
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Foreword

The necessity of evolving a national consensus on a new curriculum is manifest. The common pattern of a ten-year secondary education, followed by two years of diversified higher secondary has been accepted by all and needs to be worked out in detail. It is accepted all round that the curriculum, by way of its objectives, content and methodology, has to serve the current and emerging needs of the Indian society and the citizen, and these also need to be spelled out so that the ideas may be translated into action.

The document "Curriculum for the Ten-Year School : An Approach Paper" which follows is the result of two years' labour by a number of educationists. It is not a perfect document, and we fear that perfection or finality is not even possible in dealing with such a vital and dynamic subject. We hope, however, that concrete suggestions for change and improvement will be made which will help us, within a few months, to put forth a more acceptable version and to start working out further details and prepare relevant materials. The NCERT will soon be organizing a national conference to discuss this draft, and even though a large number of teachers, educational officials from the States, and other educationists will be invited, unfortunately, for practical reasons, many people competent to contribute good ideas may have to be left out. We, therefore, especially invite all the readers of this document to send us their criticism or comments, making specific reference to paragraphs where necessary, by 20 April 1975.

New Delhi,
10 March 1975

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I

Introduction

1. The Education Commission (1964-66) in their report on *Education and National Development* recommended a structural change in school and higher education, from the prevalent diversity in the years of schooling in the various stages of education to a broadly uniform pattern of, what has come to be known as, the 10+2+3 pattern (10 years of school up to secondary, followed by two years of higher secondary, followed by three years of undergraduate education in a college or university for the first degree). Their recommendation was based on various considerations, some of which were concerned with standards of education, modernisation and relevance of curriculum for national integration and for developing along the lines of a secular, democratic and socialistic pattern of society. The Commission's report was discussed in the Parliament and a National Policy Resolution was adopted in 1968 in which the Government had accepted the main recommendations of the Commission. Since that time, various aspects of the structural change have been discussed in the CABE, the Shukla Committee appointed by the Ministry of Education and Social Welfare, the CBSE and in many other forums of various educational associations and of other public bodies. Particularly for the curriculum of the 10+2 pattern, the Ministry of Education and Social Welfare constituted in 1973, a group of experts on various branches of knowledge. This group was later expanded to include more experts in the various areas of education, and the expanded group became, in 1974, NCERT's Expert Committee on School Curriculum. NCERT had produced a draft curriculum in 1972 which was revised in 1973 and formed the basis of the present curriculum proposed by the Committee. The Committee is developing the curriculum of the ten-year school in various disciplines and areas, through small specialist groups working within a broad framework approved by the Committee. The present paper describes this framework and the approach to the ten-year curriculum. Later, the approach to the

11th and 12th year curriculum, both for the academic and the vocational streams, would be available.

2. The school curriculum of a country, like its Constitution, reflects the ethos of that country as also its chief concerns. The values enshrined in our Constitution point towards the development of a pluralist and open society and a State which is secular, democratic and socialistic in nature. Our school curriculum should reflect these aims and values, as the Education Commission had noted. They had also observed that the syllabus in our schools is, by and large, out of date, the standards are low, the methods of teaching are traditional and the entire teaching is geared to an examination system which no longer works. Time and again, it has been pointed out by our national leaders that the vestigial remains of a colonial system of education, which was historically meant for the production of clerks, should be thrown out of the system, and the system should be revamped to respond to the growing needs, aspirations and demands of a modernising egalitarian society. In his system of Basic Education, Mahatma Gandhi gave an alternative approach to school curriculum which could help the development of a national system which is in tune with Indian society. The Education Commission incorporated in their recommendations the best that basic education has to offer, and, so, work experience and vocationalisation of education should form the fulcrum of change of the existing school curriculum to the new 10+2 pattern.

II

Salient Recommendations

1. In order to develop a curriculum which is socially and personally relevant, it is necessary to have flexibility and dynamism in it for, otherwise, with the rapidly expanding frontiers of knowledge in science and technology and the changing socio-economic conditions of our society, the relevance of any curriculum is likely to be short-lived. For a vast country like ours with its diversity of languages, social customs, manners, mores and uneven economic development, the needs and demands of the individuals and the society will have differential pulls on the school curriculum, varying from one region to another. For the sake of uniformity of standards and of national identity, therefore, it is necessary to develop a common curriculum within a broad framework of acceptable principles and values. Unless this is accepted, there is a likelihood of the "hidden" curriculum being different from the one prescribed, from one part of the country to another. While the "hidden" curriculum of a school cannot be totally done away with, the discrepancy between the "hidden" and the "prescribed" can be reduced by allowing some freedom to teachers and other curriculum workers to adapt the curriculum to the needs of the individuals and the community, provided the basic values and the national goals are not sacrificed. Besides, a curriculum, in order to remain living and modern, has of necessity, to be always in the process of development and change. Curriculum renewal should not be a sporadic and periodic effort. It has to be a necessary component of any curriculum development at any stage. It means that the educational system of a State (as well as at the Centre) has to have a built-in mechanism of curriculum renewal.

2. As the Education Commission had noted, there is a need today to transform education so as to relate it to the life, needs and aspirations of the people, and to make it an instrument of social change. For this purpose, the school curriculum should be related to productivity, social justice, national integration, modernisation of the society and cultivation of moral and spiritual values.

3. In order to reach this aim, the curriculum should have science and mathematics as an integral part of school education up to class X. The teaching of science and mathematics will have to be upgraded and the curriculum continuously renewed in order to give our children modern knowledge, develop curiosity, teach them the scientific method of inquiry and prepare them for competent participation in a changing society and culture, increasingly dependent on the rational utilization of science and technology.

4. Work experience should be a central feature of school education at all levels. It should be oriented to technology and industrialisation; to the application of science to productive processes, including agriculture. Universalisation of work experience will provide an opportunity to learn from the use of hands give insight into material and human relationships that are involved in organised productive work, create the attitudes necessary for cooperative accomplishment of tasks and discharging of social responsibility within the framework of equality of man and freedom of the human spirit.

The Unesco Commission on Education in their report, entitled *Learning To Be*, have also shown that for too long a period in human history, education has remained cloistered and segregated from life and work. When one goes to school one does not work. One begins to work, after one finishes school, and thereafter rarely goes to school or has opportunity of further education. This dichotomy between work and education is unnatural and should be broken. School time-table, courses of study, methods of instruction, examination, certification—all the aspects of school as a matter of fact need to be changed in the direction of flexibility so as to bring the school closer to the community by providing a bridge between the scholastic life and life of work.

5. Awakening social consciousness and the development of democratic values and a feeling for social justice and national integration is extremely important. Promotion of national consciousness and development of international understanding should be a simultaneous process. Tolerance; friendship, cooperation and peace between nations is possible only through a proper appreciation of each country's contribution to the world. National integration can be achieved only through a proper understanding and appreciation of the different sub-cultures of India and the common bonds that hold them together. Social studies, history, geography and economics should be taught in a manner so as to foster the spirit of scientific humanism.

6. The three-language formula must be implemented with sincerity. The aim of language education should not be only the mastery of the language. Language is one of the most powerful tools to develop a catholicity of outlook and an appreciation of the basic values of the composite culture of India.

7. An area of personal expression is aesthetic activity. Interest in beauty and the ability to discern it and integrate it into one's personality, together with other components of artistic experience, should be woven into the entire texture of educational activity. Ample opportunity must be provided to each one to preserve and develop his originality and creative talents; make use of his gifts, aptitudes and personal forms of expression.

8. Promotion of aesthetic values includes a natural esteem for physical well-being. Mastery of the body, its powers and qualities, requires knowledge, methodical training and exercise. The body must be strengthened, its skills and capacities developed, the muscles and nerves trained; the senses cultivated, hygienic and proper dietary habits inculcated.

9. The school curriculum should have a core centering round the objective of character building. The best way to do this is to help the child find the right road for his self-actualization and encourage him to follow it, watching, suggesting, helping, but not interfering. Self-actualization is a strong need in human beings; but conditions in which the child lives, its social, mental and moral environment, may not be always conducive for the fulfilment of this need. Hence, attempts have to be made to nurture the will of the child to discover its potentialities. Educational activity should be organised in such a way that, always and ever, in each and every task, the child is encouraged to express itself and find its best fulfilment.

10. Linked with this process of character building is the cultivation of such basic qualities as compassion, endurance, courage, decision making, resourcefulness, respect for others, team spirit, truthfulness, faithfulness, loyalty to duty and the common good. These can be cultivated through a programme of physical education, co-curricular activity and work experience. Activities such as social service, scouting and guiding, NCC, and the like may be considered as well as physical education, sports, games, etc.

11. The Unesco report *Learning To Be* emphasises the process of learning and particularly self-learning. Methods of teaching should change in the direction of helping individuals to learn better and on their own, not only in the school but outside the school.

The teacher will have to provide the resources for learning to the young child so that the child may discover knowledge and not just cram information doled out to it. In this matter it is necessary, particularly, to emphasise the first five years in school. This is the period when the rate of learning is fast and we should take advantage of it. But this is the time when by not teaching the child how to learn and giving it the joy of curiosity, creativity and discovery, we may demotivate the child so that it may not wish to learn in school. Children should be involved in the learning process. But children develop through ordered and sequential stages in physical, intellectual and emotional areas of growth. Although social intervention during such growth may help, children are not infinitely malleable. In cognitive development, mastery of subject matter content is not as important as the modalities of learning process. Teaching-learning situation, therefore, should be so arranged as to give the child the experience of actively solving educational problems. Care should be taken to see that the individual child can proceed at his own rate of learning and development. This does not mean that curriculum should not be structured at all ; it only means that structure should take note of these facts of development. Education, specially in the primary stage, should not lead to an overloading of the child with too many books and too much of subject matter. School education costs can be minimised in this process by changing over from a passive rote learning and cramming of knowledge to more active methods of self-learning which take care of the child's diversity of interests and allows him to develop and learn at his own pace.

12. There are some other aspects of curriculum which require attention. We have to think specially of the children from the backward sections of the community and the girls. Their numbers are not small and they either do not attend school, or, after attending for some time, drop out of the school. While attempts are being made to develop part-time education for them so that they can be brought back to the school at a later stage and non-formal education is being thought of for those who will, for one reason or another, not come back to school, it is necessary to make suitable improvements in the organisation of school curriculum, like changing of school hours to fit into the pattern of harvesting or other productive work.

13. Likewise, it would be desirable to change the present course structure which is uniform for everybody and requires one academic year without break. Instead, the entire course of studies for a given class could be broken down into smaller units. These

units could be arranged in a sequence and lead to completion of a part of a subject at the end of a semester. There are several advantages of this type of organisation. Teaching units would be pedagogically more meaningful. Often some areas of study are considered important for the curriculum but they cannot be dealt with by assigning them to a single existing discipline—such areas are, health, sanitation, nutrition, population studies, pollution, water resources, elements of psychology and of culture. Such sectors can be best taken up as “units” in a sequence where they fit.

14. Each unit could be evaluated separately, thereby reducing the burden at the end of the year : whereas in the present system either there is promotion of all without examination or there is annual examination covering the courses of studies for the entire year leading the child to learn how to cram a large mass of undigested and half-digested information in a short time and thereafter forget it conveniently. The units could be grouped together so that a more meaningful inter-disciplinary understanding of natural phenomena could develop. Children who have not learnt some units well could repeat only those units, or remedial instruction for those units only could be arranged, or self-learning materials and other resources of learning could be made available to them to be used by them at their own time and place. Unit-wise course organization will also make it possible to prepare separate curriculum for the primary, middle and secondary stages wherever such stage-wise organization is considered necessary.

15. In the matter of textbooks, it will be good to restrict the number of textbooks to the minimum. The “Units” for a particular year could perhaps be put together in one or more volumes. A number of units could possibly be common throughout the country. Children should be encouraged to read supplementary readers in which a wide choice should be available to meet the needs of the individual child. It will encourage self-learning and foster curiosity. Care should be taken to see that supplementary books are available on a number of subjects and topics for the general education of the students.

16. If the ten-year school curriculum has to develop along the lines noted above, it will be necessary to utilise and coordinate the institutions and their resources at all levels from the district upwards to the centre. Universities, State institutes of education and NCERT, in particular, will have to work together. Suitable changes in educational administration and particularly in the inspection and supervision of schools in the States will have to be

introduced so that the curriculum practised in the schools in a State may have the characteristics we have discussed earlier in this paper.

17. Broadly speaking curriculum is supposed to be the sum total of all the deliberately planned set of educational experience to be provided to the child under the overall umbrella of school. More specifically, it is concerned with

- (i) the general objectives of education at a particular stage or class ;
- (ii) subject-wise instructional objectives and contents ;
- (iii) scheme of studies and time allocation ;
- (iv) teaching-learning process ;
- (v) instructional aids and materials needed ;
- (vi) evaluation and feedback.

Developing a curriculum reflecting all the above components in an integrated well-coordinated and properly articulated form requires systematic and sustained effort over a period of time. In order to be practicable and functional, it has to be based on actual try-out and research.

III

Stage-wise Objectives of General Education

1. The broad objectives of general education have a limited utility unless they are spelt out in terms of stage-wise and subject-wise objectives for the guidance of educational planners, administrators, supervisors and teachers.

Objectives of Primary Education

2. This stage of education covers roughly children of age 6+ to 11+ reading in classes I to V. This is a very crucial stage in the life of a child. In view of the need for rapid universalization of primary education, it has an added significance. It will be helpful to identify realistically the basic minimum to be achieved in respect of each and every child and leave enough scope for individual schools to go as far beyond this basic minimum as their circumstances permit. There should be enough scope for flexibility and local adjustments. The objectives of education should be considered in the context of the social, intellectual, emotional and physical maturity levels appropriate to the age-group under consideration. The child's spontaneity, curiosity, creativity and activity, in general, should not be restricted by a rigid and unattractive method of teaching and environment for learning. Keeping these in mind, the objectives of education at this stage may be stated as follows :

- (i) The child should develop a respect for national symbols, like the flag and the anthem. It should be acquainted with the democratic processes and institutions of the country. It is of utmost importance, however, that he should inculcate the values of national integration and denigrate untouchability, casteism and communalism.
- (ii) The child should learn the method of inquiry in science and should understand the applications of science and technology in the life of the community.
- (iii) The child should develop facility in the four fundamental numerical operations and be able to apply these in the life of the community and solve problems.

- (iv) The child should learn the first language which is generally his mother tongue to a level where he can communicate easily with others through properly articulated speech and in writing. It may also learn to read a second language.
- (v) The child should learn to do some useful work and acquire a healthy attitude towards human labour and its dignity.
- (vi) The child should develop habits of cleanliness and healthful living and an understanding of proper sanitation and hygiene of its neighbourhood.
- (vii) The child should acquire a taste for the good and the beautiful and should take care of its surroundings.
- (viii) The child should learn to cooperate with others and appreciate the usefulness of working together for common good. Other desirable qualities of character and personality like initiative, leadership, kindness, honesty should also be developed as well as an understanding of its role as an individual in the home, the school and the neighbourhood.
- (ix) The child should be able to express itself freely in creative activities and should acquire habits of self-learning.

Objectives of Education at the Middle Stage

3. The classes VI to VIII cover the middle stage when the normal age-groups should be from 11+ to 14+. During these years, the children become adolescent and these years can become difficult for many children, for whom the passage from pre-puberty, puberty to post-puberty is not smooth. Problems of adjustment in the family, in the school and in society, in general, begin to appear. The child becomes in this period a boy or a girl with greater intellectual, emotional, social and physical maturity than the primary school child. Social demands and responsibilities begin to appear. Particularly for the girls in our society, special attention has to be given, at this stage. They have to be prepared for maternity and child care and for the development and maintenance of a home. Just as the boys have to be prepared for the world of work outside the home, the girls will have to be prepared particularly for the work inside. The curriculum at this stage will have to operate within these constraints. The objectives of education, however, maintain a continuity with those for the earlier years except that they operate at a higher level of complexity, involving greater knowledge, deeper understanding and a grasp of principles.

4. Thus, in the matter of national integration, the children should develop an understanding based on knowledge. Through a proper study of history and geography, they should know our constitution and the values enshrined in it. They should have a sound knowledge of the democratic processes, structures and institutions in our country. Their understanding of the development of the nation through the study of history and geography should be deepened and widened by their knowledge of world culture and civilisation.

5. In the matter of languages, this is the stage when a second language should be learnt to the extent of making the child ready to comprehend ordinary speech in that language as well as simple pieces of writing in prose and poetry. Its mastery of first language, however, should now be greater and it should be able to appreciate literature. A third language may also be learnt at this stage. But only a beginning may be made in reading.

6. In science and mathematics, physics, chemistry, biology and mathematics should be introduced. At the same time environmental education, nutrition, health and population education should receive adequate attention so that science is related meaningfully to life. This is the age when work experience should emphasise agricultural and technological processes and tools to help the integration of science, mathematics and technology with production and life of the community.

Objectives of Lower Secondary Education

7. The lower secondary stage covers only the two classes IX and X and the age range usually of 14+ to 16+. These two classes complete the ten years of general education. After this, there are three possible courses open to students : (a) they can enter the working force, (b) they can take vocational courses, and (c) they can take higher level academic courses of study to prepare for entrance into the first degree class in the college or university. The ninth and tenth years in the ten-year school should, thus, be terminal for a large majority of students who are likely to choose alternative (a) above. It is, therefore, necessary to bring their education beyond the middle stage up to a standard, which will give them the competence to enter life. This means that the process of acquiring useful knowledge and skill, proper work habits, attitudes and character which contribute to productivity and national integration which had started from the middle stage should be accelerated and brought to a satisfactory level of development. The Education

Commission had thought of minimum national standard of attainment in this context so that those areas of the country and those sections of the society which are backward could come up and compete fairly with the rest of the people. Hence, while maintaining a continuity of the objectives of education from the previous years, it is necessary to pay attention to the academic subjects as well as to the knowledge and skill required for doing socially productive work. These two years, however, are crucial from the point of view of the development of personality. While from the onset of puberty in the middle stage, there are problems of adjustment which the young child has to cope with, it is in this stage that they become acute and the additional preparation for a transition from the life of a school student to that of a productive person in society has to be undertaken. It is, therefore, necessary to give here some psychological insight into his problems and the knowledge that may help him to understand his own behaviour as well as those of others around him. Keeping all these in view, we may consider some relevant changes in objectives stated for the lower secondary stage.

8. In science and mathematics, the student should have competence to apply his knowledge to the solution of problems around him. He should have an understanding of the technological processes in agriculture and industry in his surroundings. He should be able to contribute meaningfully to environmental conservation, reduction of pollution, development of proper nutrition, health and hygiene in the community. Girls should particularly be able to help in the development of proper habits and attitudes in child care and in improvement of the home.

9. The student should have learnt by now a broad group of work, knowledge and skills making it possible for him to enter into a job, if he wants. He may learn one or two useful trades. But it is equally important to give him enough knowledge of materials, tools, techniques and processes of a job family so that he can enter life with some confidence.

10. As regards languages, the three languages which have already been learnt up to the middle stage may be continued. The first language should be learnt thoroughly and up to a point where some of the best specimens of literature in that language can be meaningfully understood and appreciated. The second language should be learnt up to a level where one can speak the language fluently and with confidence, and can read ordinary literature with reasonable speed and understanding. The third language should have been learnt up to a point where the student

can show reading comprehension of good prose and poetry in that language.

11. Apart from learning the other subjects like history and geography, the student should develop an understanding of the social cultural phenomena, not only in India, but in other countries of the world also and particularly our neighbours. His experience in co-curricular activities, physical education, games and sports should lead to the development of desirable social attitudes and values like those of kindness, cooperation, team-spirit, fellow-feeling, leadership, courage, truthfulness, honesty and sincerity. He should be able to understand the value of national and civic property and be able to take care of them. He should have a clear grasp of the principles of democracy, secularism and socialism.

IV

Subject-wise Instructional Objectives and Contents

1. Having broadly defined the objectives of education at different stages, the next step is to plan learning experiences for their realization. Learning experiences in school arise out of subject teaching as well as other activities. Therefore, what subjects are to be taught, what objective are to be realized through each subject, what methods and materials are to be applied so as to provide the best possible experience to pupils within the resources available to the schools, the allocation of time to curricular and co-curricular activities and distribution of time over various curricular areas need not be thought out. What should be evaluated, how often, by whom and by what method also needs thinking. In the present section discussion is limited to the objectives and contents of different curricular areas at different stages and only very broad outlines are being presented for the guidance of curriculum workers.

2. As has already been pointed out earlier, the first ten years of school education should be spent on providing a broad base of general education to all pupils. The curricular area proposed for the purpose are as follows :

- (i) Sciences
- (ii) Mathematics
- (iii) Work Experience
- (iv) Social Sciences
- (v) Languages
- (vi) Art, Music and other Aesthetic Activity
- (vii) Health and Physical Education.

3. The above list should not be taken to be exhaustive of all that can happen in a school. Other subjects should be available to students for supplementary reading and of course the curriculum should provide for co-curricular programmes. By develop-

ing the semester system, as stated earlier, and adopting the unit approach to instruction and evaluation, much flexibility can be introduced into the system and opportunities provided for expression of diverse interests and ability. Specially for the children from the backward sections of the society, such a flexible system would allow for provision of special types of courses by way of remedial instruction. Multiple-entry and part-time education would be possible, although a special syllabus may have to be worked out for the same. An attempt should be made to develop Pioneer Palace type activities for children where these activities will be self-selected and help in the development of their personality. It should be possible to have only a few textbooks in the primary stage. The possibility of having only one textbook per semester may be explored. This can be done if there is an integrated curriculum for classes I-V, instead of the usual variety of subjects. This will require an inter-disciplinary approach. Language learning should not be considered to be taking place only in language classes. Much of it goes on in learning other subjects also.

The Sciences

4. There is a hardly any need today to justify the place of science in a scheme of general education for school children. Science is all pervasive. Modern societies exist on the basis of science ; science is intimately related to the means of production and means of communication including transport. Even Economics and Politics have to depend on scientific factors such as productivity from land or from industry, power of modern weapons or the speed of transportation of ground and air forces. In the present situation, anyone, therefore, in any walk of life must be aware of certain quantum of science and technology. Secondly, the scientific method extends far beyond science. All disciplines are becoming scientific. The method of observation, of making symbolic, graphical or linguistic models, designing experiments, of applying reason as well as imagination to draw conclusion from data to formulate theories, the method of keeping an objective view while theories are tested is a method which pervades every discipline. Facts of today may not be the facts of tomorrow and theories may also undergo change, but there can be no going away from the method of science.

5. It is significant to note that science also helps in reducing general obscurantism and all sort of prejudices based on case, religion, language or region, By emphasizing rational approach

and a challenge to think and reason, science is also likely to help in supporting a democratic and secular state system.

6. One may try to create in a student self-confidence but no aggressiveness ; one must try to balance a disciplined and highly organised inner self with uninhibited initiative and non-conformism where necessary. Or to put it differently we must inculcate culture without overwhelming the individual, discipline without smothering ability to confront society with new ideas and processes.

7. In primary cases I to V the subject may be environmental studies as a composite course including both the natural and the social environment in class I and II, and later on as two subjects environmental studies I (natural science) and environmental studies II (social science). One need not lay down how much of this should be covered in a particular class but at the terminal point or around the age of 11 they must have seen and experienced as much as possible. The purpose should be not to stuff the minds of children with facts and information but to sharpen their sense, to enable them to observe their environment and to enrich their experience related to different branches of science to the maximum possible extent at their level of development.

8. It may be pointed out that since the environment and the experiences of the children outside the school vary from place to place the activities provided in the school should also vary so that the edifice of knowledge is built not on abstract concepts alone but on the solid foundations of experience drawn from the environment of the child. In such a programme neither, should an inflexible syllabus be drawn up for all the schools nor can a single textbook be prescribed for all children. In fact there has been criticism by knowledgeable people that many of our science textbooks are urban biased. Textbook should not be given any importance so far as the learning of science is concerned. What is really important at this stage is to provide teachers with teacher's guides and instructional material. However, reading material for children must be very thoughtfully prepared to motivate them.

9. In the age group 11 to 14 (classes VI to VIII) a number of State have already gone ahead with the introduction of Physics, Chemistry and Biology as disciplines. They may review this Policy. But some other states who have not yet adopted that policy should develop integrated courses up to class VIII on the pattern of the Nuffield General Science programme. Some of the states may also try with groups namely Physical Science including Physics and Chemistry, etc., and Biological Science comprising

Botany, Zoology and Human Physiology. The unit approach (pp. 6-7) which does not violate disciplines but at the same time bring them closer and effectively provides a more logical and economical procedure has great potential and should be adopted as far as possible. This holds good for classes IX and X as well. In these classes laws and theories should be gradually introduced taking care that they are not introduced as dogmas. Pupils should be made to understand that many models are available and one of them is the one they are learning. Openmindedness and scepticism should be encouraged.

Mathematics

10. Mathematics has helped mankind ever since his primitive days to quantify ideas, to be precise and to utilise spatial concepts in his day-to-day living. Its place in the sciences and in the practical arts, from informational and computational stand-points as well as its cultural significance, make it indispensable in our living. In a society that is rapidly transforming into an industrial and technological society, mathematical literacy is essential for every citizen. The objectives of mathematics education at the school stage should be :

- (i) To enable students to cultivate a mathematical way of thinking, i.e., in terms of carrying out experiments with numbers and geometric forms, making hypotheses, verifying them with further observations and experiments, generalising them, trying to find proofs and making abstract ons, etc.
- (ii) To enable the students to quantify their experience of the world around them and to understand the process of applying mathematics to real life problems.
- (iii) To enable the students to learn the basic structures of mathematics through unifying concepts and to motivate structures through applications and concrete situations.
- (iv) To stimulate the students to study mathematics on their own and to develop a taste and feeling for mathematics.

11. The first ten years of schooling are to provide general education to all the pupils. No diversification of courses is envisaged in classes IX and X. Therefore, mathematics should be compulsory for all students up to class X.

12. This subject should be offered in classes IX and X, at only one level, i.e., the ordinary level and not at two levels, i.e., ordinary and advanced. The level of the general course should

be high enough to provide the base for advanced study in later years and also to equip the individual with the necessary competence to be able to tackle day-to-day problems.

13. At the primary stage, the child will be introduced to numbers, the fundamental operations on them and their elementary properties. Concepts of length, width, time, area and capacity will be developed along with the units of measuring these. The child will gain familiarity with geometrical forms and figures and also with elementary notion of algebraic symbols. Simple applications of the fundamental operations and arithmetical processes to every day life problems will find an important place at this stage.

14. At the middle stage, the number system will be extended to real numbers as also the operations. The student will be made familiar with the language of algebra and linear equations and inequations in one or two variables introduced. The concept of sets and their notations, as also elementary concepts of statistics will be developed. Application of arithmetical processes to problems of daily life will be further extended, and properties of triangles, quadrilaterals and circles and area of regular figures and solids will be developed on practical lines.

15. In classes IX and X, real life problems using compound interest, rates and taxes, profit and loss will be handled by the students. Knowledge of algebraic processes will be systematized and extended. The idea of proof will be developed and elementary theorems on triangles, parallelograms and circles taken up. Introduction of trigonometric ratios and use of descriptive statistics along with measures of central tendency and dispersion should be made at this stage. History of mathematics with special reference to India and nature of mathematical thinking will permeate the entire course.

Work Experience

16. For a harmonious development of the child's personality, it is necessary not only to expose him to scholastic areas for intellectual development but also to put him in situations where he may get opportunities to work with hand and develop proper attitudes towards manual labour. In addition, there is an urgent demand for making education job oriented and to bridge the gap between the world of school and world of work. This gap will widen further if not controlled early due to the modern technological developments and an increasingly technology-based society of the future. Processes and skills are changing. An

early initiation of children into these is possible only through work experience. That is why the Education Commission (1966) made a strong case for introducing work experience as an essential component of general education at all stages of school education.

17. Work experience provides the socially useful exploratory experiences leading to productive work. Work experience should cover three processes, viz., production, maintenance and technological processes. Areas of work chosen should have local orientation and should be acceptable to students.

18. Work experience programmes can serve the following objectives :

- (i) To learn from work ; to become familiar with basic materials, tools and processes and to develop occupational skills.
- (ii) To develop insight into productive processes and relationships and to develop good work habits.
- (iii) To develop cooperative attitude and realise dignity of labour through social and useful work experience.
- (iv) To acquire a sense of achievement, self-help, and self-confidence.

19. At the primary stage, work experience should begin with simple creative, self-expressional activities performed with locally available material and simple tools. No activity with an element of monotony in it should be provided. In the upper-primary (or middle) and secondary classes, use of tools should be introduced in a scientific manner.

20. Work experience areas should be identified through community surveys and, wherever necessary, the expertise of artisans and mechanics should be availed for the programme. In technologically oriented work-experience, desired level of skill and precision may be attempted.

21. In order to give students experience in a sufficient number of work areas, it is suggested that in any work division, one area of work may be offered for a particular term and similarly another area in another work division in the next term. Thus in a year, experience in 3 areas of 3 work divisions would be possible. In the following year, other areas can be offered, changing the division from which the area is selected every term.

22. Students may be given the chance of specializing in a particular work area by following it at three different levels. Such specialization could lead to getting a job at the end of the third

round of training. It would be desirable to explore the possibility of providing some experience at least to class IX or class X students on an actual place of work such as a field, a factory or a similar establishment.

23. The actual areas to be included in the curriculum would be governed by local needs. Work areas from all the six work divisions may, however, be included so as to provide a variety of experiences to students.

24. Work experience is visualized here as a distinct curricular area aimed at providing experiences which are not otherwise provided. However, it has ramifications into other subject areas and provides a basis for integrating knowledge.

The Social Sciences

25. The major objective of the study of Social Sciences is to acquaint the child with his past and present physical and social environment. An effective programme of teaching of Social Sciences in schools should help the pupils to take keen interest in the ways people live and function through various socio-economic and political institutions. It should also help children to develop an insight into human relationships, societal values and attitudes. These are essential for a growing citizen of tomorrow to participate effectively in the affairs of the community, the state, the country and also the world at large.

26. The teaching of social sciences should enable children to appreciate India's rich cultural heritage as also to recognize and get rid of what is undesirable and antiquated, especially in the context of social change. The schools should see that narrow parochial, chauvanistic and obscurantistic tendencies are not allowed to grow in our pupils. The schools should endeavour to develop a will and ability in every pupil to participate in the most important task of reconstruction of our society and economy with a sense of social commitment. Children should also develop a faith in the destiny of our nation in terms of promoting a spirit of tolerance and assimilation and promoting peace and harmony among the peoples of the world. Thus instruction in the social sciences should promote the values and ideals of humanism, secularism, socialism and democracy. It should inculcate attitudes and impart knowledge among the pupils necessary for the achievement of the principal values of a just world order, maximization of economic and social welfare, minimization of violence and maximization of ecological stability.

27. The study of social sciences in classes I-X shall include the study of history, geography, civics and economics. In view of the limited time that will be available for each of these branches, it should be desirable to integrate their teaching in a way that the pupils develop a proper understanding of the facts and problems in the right perspective without causing any damage to the totality of individual disciplines. This would require identifying essential units (pp. 6-7) in each of the branches and then unifying them into an integrated syllabus for social sciences.

28. Since classes V, VIII and X are terminal stages for a very large number of students, it is necessary to visualise a three-tier high school system with self-contained courses of study at each stage where the curriculum at each stage would lay the foundations on which one for the subsequent stage would be built up. While following this principle, it is also necessary to avoid repetition and waste of time and energy as far as possible.

29. **Primary Stage.** (Classes I to V)—Social studies as a composite area of instruction. It should be taught as part of the study of the environment in classes I and II and as an independent subject of Social Studies in classes III and IV and V. Environmental Studies will include both natural and social environment in classes I and II. It would be more appropriate to use the term Social Studies rather than Social Sciences at the primary school stage since it represents a broad and composite instructional area. It draws its information from different social sciences such as History, Geography, Civics and Economics, in order to unfold gradually the total environment of the child with special reference to physical, social and cultural elements. While presenting facts from all these areas, the primary concern of the school at the stage should be to develop necessary social skills, values and attitudes that would enable the child to contribute his mite, as he grows, towards the development of the society to which he belongs.

30. During five years of primary school the child's mental horizon would be gradually widened from home, school and local community to that of an elementary idea of the earth to which he belongs. In the process, the child would begin to appreciate geographical elements of his environment. Various human activities which help him to understand how gifts of nature are processed to produce goods for serving various needs of man, would also be studied. He would also get an idea of social and cultural life in different parts of the country as well as of a few different ways of living in certain parts of the world. Stories and narratives about personages and events that have contributed to our national

heritage and human heritage, will also be studied. In addition to these, the child would get ample opportunities to develop socially desirable habits, attitudes and values, besides being broadly acquainted with the functioning of political and social institutions.

31. **Middle and Lower Secondary Stages.** For the organisation of content in Social Sciences comprising History, Geography, Civics and Economics in the next five years of education, i e., from classes VI to X, three different approaches can be visualized.

1. History, Geography and Civics may be introduced as separate disciplines in the middle classes and carried over as such to high school classes while Economics may be introduced at the high school stage as a separate discipline.
2. History and Civics may form one group and Geography and Economics another group and these two groups may be introduced right in class VI and carried up to class X.
3. The content of History, Geography, Civics and Economics may be identified in an integrated manner for all the five years taken together.

While the first two approaches are common today and do not need any elaboration, except that they contribute to isolation of disciplines amongst themselves and of disciplines from problems or situations in the last approach (which is recommended, pp. 6-7) it would be necessary to identify essential units in each subject in two cycles of three years and two years. The Units thus identified for the first cycle of three years may be integrated and arranged sequentially between and within subjects in the form of a common syllabus for social science. For the next two years of education, a similar exercise may be done treating the earlier cycle as the base. Some old units may be taken at a greater depth while new ones introduced in each subject so as to lead to a slightly more advanced integrated syllabus in the above subjects. While selecting units from individual subjects proper care may be taken to see that no violence is done to the structure and discipline of the subject and yet only those facts and principles are included which are of functional use to an Indian adolescent in his life as it grows into adulthood and also as a base for a systematic study of the different disciplines in higher classes as separate subjects of specialization. The scope of different subject areas as visualized at the middle and lower secondary stages is given below.

32. The teaching of history at the middle stage should acquaint the pupils with the growth of Indian Society from the

prehistoric times to the present. It is necessary to change the emphasis from dynastic history and political details to social and economic conditions and the growth of various aspects of culture in different parts of the country. At the same time, a broad perspective of the history of mankind as a whole should also be provided.

33. The organisation of the syllabus and the selection of the content may be based on what is known as the 'patch' approach. In the light of the requirements of general education it is not necessary to give a continuous chronological account of the history of India in the sense that every decade or century of Indian history is covered. Representative periods or 'patches' in a chronological order and dealt with in all their important aspects, may be given. This may be combined with the 'topical' approach in that in a particular 'patch', a few aspects would be selected to be studied in greater detail than other aspects.

34. It is suggested that classwise distribution of the Indian history syllabus may be as follows. Class VI—Ancient India, class VII—Medieval India and class VIII—Modern India. Along with this, with each of these major periods of Indian history, a broad perspective of the contemporary history of mankind as a whole should be provided.

35. Civics should aim mainly at imparting training in civic life rather than mere scholarship. Civics programme should contain such socially imperative knowledge, which would not only impart understanding of the civic processes but would also provide training in the development of the civic competencies and civic abilities.

36. The course envisages the study of local government and Indian Constitution in VI and VII classes respectively and in the last year, i.e., in VIII class the students would study the actual problems that are facing India today. In the course some practical aspects of citizenship education and the elements of economics should also be incorporated from the point of view of adopting a functional and integrated approach.

37. Though many of the activities and topics of study included under this scheme may be organised by the teacher in the class or school, it is suggested that the training would be more fruitful if the students are taken out of the class and involved in real life-situations.

38. Geography at the middle school stage has to perform two distinct functions : (i) introduction of the students to Geography as a school subject so as to develop their interest in the same and

(ii) reinforcement of value, attitudes and general understanding that would promote the objectives of citizenship education. Although these two functions have been listed separately, in practice they are not exclusive of each other.

39. At the middle school stage, the course would necessarily be more descriptive and within the broad framework concentrate on imparting knowledge about India in the context of the world which we have to share with other peoples characterised by their diverse ways of living. It should bring home to the pupils the interdependence of various regions of the country and the world. They should begin to appreciate that it is only through sharing with others that the peoples of the world can really enjoy the blessings of the mother earth.

40. For a successful living in a developing society where socio-economic changes are occurring rapidly, it will be helpful if some rudimentary understanding of economic forces that influence the citizens' daily life is given even at the middle stage. From this point of view, it appears desirable to introduce some elementary knowledge of consumer economics such as earning and spending, controls, price rise and effects of increasing population in a very simplified form.

41. A systematic course in the history of mankind from pre-historic times to the present day should be introduced for classes IX and X. This does not mean a chronologically continuous narrative but the selection of 'patches' that have certain unity and distinctiveness along with many diversities. The main basis of the selection of these 'patches' may be the successive stage of distinct social formations that existed in different parts of the world in specific chronological periods. The main focus of this course should be on the study of social systems in their rise and growth and their replacement by new forms and on scientific and cultural development. The historical development of all the major areas of the world, including pre-colonial Africa and Americas, should be covered. The selection of the content should be based on the specific histories of individual countries only where these histories have a significant bearing on the general history of mankind and represent new trends which became relevant to the history of mankind as a whole.

42. Along with the above, there should be a course in depth of certain aspects of Indian history, particularly of social, economic and cultural development and of the factors that have a close bearing on the understanding of contemporary India.

43. In these classes, the two major objectives of teaching civics should be (i) to promote an active and intelligent citizenship, and (ii) to develop an intelligent understanding of the structure and working of the social and political institutions. In addition to this, an understanding that the U.N.O. is playing a significant role in strengthening world peace and cooperation should also be promoted.

44. From this point of view the course in class IX envisages the meaning of scope of Civics, community life, forms of government, rights and duties and democracy in action. In class X, the students would study the structure and functions of political and social institutions in India and the role of U.N.O. in maintaining world peace. Some basic elements of sociology should also be introduced.

45. At the terminal stage of general education the subject of geography should shift its emphasis from mere descriptive to somewhat analytical and conceptual in its presentation. This should bring it closer to the philosophy and spirit of general education. A few selected detailed studies from the world and economic geography of India should also be undertaken, besides brief analytical study of all the different aspects of the same.

46. The approach to the teaching of Economics at the lower secondary stage would emphasise not so much the principles of economics as the current problems and issues that effect everyday life of the common man. While doing so, some light would, of course, be thrown on the principles of economics as well. Such an introductory course would, it is hoped, lay down the necessary foundations for a more systematic and rigorous course in classes XI and XII.

47. The proposed course would include a brief review of economic conditions of India at the advent of the British Rule. This would prepare ground to understand the need for economic development of India through the National Plans and help to appreciate their objectives. As a part of his initiation to the economic institutions, the child would be introduced to the role of money and financial institutions. The current economic problems such as poverty, rising prices, agricultural stagnation, etc., would be discussed. The course would throw some light on the future economic prospects of the country on the basis of its potential resources and the performance shown so far.

48. In the middle and the lower secondary stages, curriculum units based on psychology should be developed so as to help the adolescents to cultivate an insight into their problems of growth,

development, social relations, personality and adjustment to life and work.

Languages

49. The national policy on the development of languages has recommended the adoption of the three language formula at the secondary stage. In the light of the broad requirements of this formula, a child at the completion of ten years should be competent in the first language, be able to understand and express himself in the second language and should be able to comprehend the third language in its printed form. The first language will most often be the mother tongue. The second language will be Hindi where it is not mother tongue. It will be another Indian language where the mother tongue is Hindi. The third language should usually be English, but could also be any other foreign language. Sanskrit or Persian could be introduced as a part of the first or second language. It can also be introduced separately as a fourth subject.

50. By the end of the primary stage, the pupil should have acquired competence to express orally as also in writing through the standard form of the mother tongue correctly within the limits of structures and vocabulary normally expected at this level of development. The pupil should be able to read loudly with correct pronunciation, modulation of voice, posture, proper speed and comprehension. The pupil should acquire the right habit of silent reading with comprehension. It should be able to listen with comprehension simple narrations at its level.

51. At the middle and secondary stages a greater enrichment of all the above skills through more advanced linguistic and ideational content is expected. The objectives of teaching the second and third languages are also on similar lines except for the fact that their teaching is planned keeping in view that the exposure of the pupil to these languages is very much restricted and there is hardly any chance for the child to enrich its command of these languages except through reading. Therefore, the teacher of these languages should be satisfied if the pupil learns to operate satisfactorily within the limits of controlled vocabulary and graded structures. In addition to aiming at the development of the above skills, language courses should be so designed as to contribute to the inculcation of right attitudes, interests, basic human values like compassion, honesty, tolerance, truthfulness, national consciousness, sense of discrimination and spirit of enquiry.

52. The second language may be introduced in primary stage or in middle stage. The third language should be introduced in

class VI. All the three languages should however, be continued up to the end of class X. The selection of content in language books must be such as to inculcate desirable attitudes and values and a general appreciation of the life and culture of the people concerned. Oral-aural techniques of language teaching should be introduced.

53. No language should be treated as optional and non-examinable subjects during the school stage. Provision, however, may be made for the study of other Indian and foreign languages at the middle and secondary stages as additional subjects. It should be kept in mind that language learning is helped considerably by the learning of the subjects. It should, therefore, be possible to keep the load of language teaching within reasonable limits, and to include a good portion of selections from other disciplines (curricular or co-curricular) as material for language teaching.

Art, Music and other Aesthetic Activity

54. Art education begins with the education of the senses. To this should be added the cultivation of discrimination and the aesthetic sense, the capacity to choose and take up what is beautiful and harmonious, simple, healthy and pure. As the child grows in capacity and understanding, he should be taught in the course of his education to add aesthetic taste and refinement to power and precision. He must be shown, made to appreciate, taught to love beautiful, lofty, healthy and noble things, whether in nature or in human creation. A methodical and enlightened culture of the senses can, little by little, remove from the child whatever has been vulgar, common place and crude in him ; for one who has developed a truly refined taste, because of this very refinement, will feel incapable of acting in a crude, brutal or vulgar manner. This refinement will also give his character a nobility and generosity which will spontaneously find expression in his behaviour.

55. The teaching of the different Arts—dance, music, painting, etc., should be based on the same fundamental principle to give to the student an opportunity for perfecting his own capacities and to help and encourage him in the process.

56. Art education is a neglected area in the school curriculum. Whatever little art education is imparted the emphasis is on the learning of the arts skills whereas the goal of a t education should be the inculcation of the aesthetic sense which permeates all activities and not only the learning of the arts skills.

57. The attitude to the arts in the educational system is full of prejudice ; the arts are supposed to be intended for the dropouts or

the slow learners only. Such attitude needs to be changed. Anything which becomes a vehicle for self-expression and for creativity should be taught to all students rather than to a handful who may be extraordinary in either singing or painting.

58. The purpose of art as a teaching subject has been redefined. The old concept of teaching skill of drawing has been dispensed with. According to the new thinking in art education, the child is considered as a centre of all creativity, art, as a medium of expression (so natural to his instincts) and art activity, as an experience to involve him to explore, to experiment and to discover for himself.

59. The principle of 'Learning by doing' which forms the basic of the liberal methods of teaching art, implies also, self-discovery through self-expression for the child. Art, therefore, is a training in seeing, sensing, in feeling and finally in doing.

60. At the lower primary stage, the teaching of art should not be fragmented into different disciplines. Art instruction should be an integrated total experience. The subject to be included are fine arts, music, dance and drama. The child should be exposed to a variety of media of expression. The contents should revolve around the relationship of child with his environment both within and without. The teaching approach should be such as to provide to the child maximum enrichment material for developing his liking and understanding about them.

61. At the middle school stage, the art teacher, however, should avoid any direct instruction and should induce and motivate the pupil enough to let him mobilise his own resources to find out appropriate means for self-expression. Guidance in techniques should be indirect and inductive, although the child should be exposed to evaluate and appreciate works of art in his sphere of interest. More and more media should be introduced for his exploration and use in self-expression. Individual style of the child should be encouraged and respected. Topics suggested should be related to his experience.

62. The high school stage is a transitional period between the creative expression of the childhood and vocation biased training of the later period. Here again as before the direct instructions in techniques should be avoided. The adolescent should be induced to acquire them as far as possible through exploration and discovery.

Health and Physical Education

63. The National Plan of physical education which was formulated by the Government of India for the first time in 1956

states that "physical education should aim at making the child physically, mentally and emotionally fit and developing his personal and social qualities which will help him to live happily with others and build him into a good citizen." It further emphasises that the development of total personality and the achievement of worthy citizenship motivated for service should be the outcomes of physical education.

64. A wholesome and methodical programme of physical education may be expected to bring about the following results :

- (i) A sound and healthy body. This is a vast subject on which a good amount of knowledge has already accumulated. The means include the acquisition of good tastes in food, sleep, hygiene, and the use of physical exercises to regulate the various functions of the body.
- (ii) Strength and fitness. Not only muscular strength and physical stamina but the skill, dexterity, endurance which sports and games develop and which are an excellent preparation for many occupations.
- (iii) Training of the senses. A quick perception of the eye and ear and a quick response of all the parts of the body to any call made upon them, a wonderful co-ordination and mastery over the reflexes as for instance in gymnastics and balancing.
- (iv) Not only strength, but also grace, beauty and harmony. Beauty is not a superfluity but the very spirit of the physical world.
- (v) Self-mastery and discipline, courage and confidence. To control one's impulses, reactions, weaknesses is a very important gain brought about by the practice of athletics and games.
- (vi) Cooperation, impartiality and fair dealings with others. These qualities are especially developed by team-games.

65. A well planned programme of physical education, Boy Scouts, Girls Guides, and NCC, etc., can be of help for the cultivation of such basic qualities as endurance, courage, decisions, resourcefulness, respect for others, truthfulness, faithfulness, loyalty to duty, and the common good. These activities may be in addition to the one and compulsory programme of physical education.

66. Mere emphasis on physical training, drill or formal activities will have to be replaced by a broad based programme of physical education. The curriculum in physical education should

be so designed as to ensure participation of the entire student population from primary to lower secondary school stage of education, spot out talents in sports and games and provide opportunities for nurturing these talents.

67. Since physical education is an integral part of general education, it should be incumbent upon every child to participate in the programme as provided in the time table. Activities such as social services, scouting and guiding, NCC and the like may be in addition to the core and compulsory programme of physical education.

68. Warmer hours of the day should be avoided for physical activities programme. Morning and evening hours are most suitable. Hours would differ from season to season. Local climatic condition should also be taken into account while providing periods in the time-table and preparing programmes of tournaments, competitions, etc., under physical education.

69. Medical inspection should be compulsory at each of the primary, middle, and lower secondary school stages of education with follow-up in cases in which medical/physical defects are noticed.

THE SCHEME OF STUDIES AND TIME ALLOCATION

70. **Scheme of Studies**

Classes I & II

1. Language (First)
2. Mathematics
3. Environmental Studies (Social Studies and General Science)
4. Arts
5. Work Experience
6. Health Education and Games.

Classes III, IV & V

1. Language—First (second also may be)
2. Mathematics
3. Environmental Studies I (Social Studies)
4. Environmental Studies II (General Science)
5. Arts
6. Work Experience
7. Health Education and Games.

Classes VI, VII & VIII

1. Language—First continues, second (Hindi or English) and third (A modern Indian language, Hindi or English) are added.
2. Mathematics
3. Social Sciences—(Elements of History, Geography, Civics and Consumer Economics)
4. Science—(Elements of Physical Science & Life Sciences)
5. Arts
6. Work Experience
7. Physical Education, Health Education & Games.

Classes IX & X

1. Languages—First, second and third.
2. Mathematics
3. Social Sciences—(History, Geography, Civics and Economics, etc.)
4. Science—(Physics, Chemistry & Biology, etc.)
5. Arts
6. Work Experience
7. Physical Education, Health Education & Games.

71. Instruction Time in School

There should be a minimum of 240 working days in a year, out of which 220 days are for instruction and 20 days for school camps and community services, etc. Instructional time in the lower primary classes may be 4 hours per day. In the upper primary or middle classes and the lower secondary classes, instructional time should not be less than five hours. In addition to the instructional time, each school day is expected to devote one hour more in the primary classes for the daily assembly, routine activities and one or two recesses. In the upper primary and lower secondary classes 50 minutes may be devoted to the morning assembly and one recess.

72. Subject-wise Allocation of Time in Classes I-V

The subject-wise allocation of time in these classes should be flexible, to allow for an integrated approach to curriculum implementation. Projects and group activities which cut across subject boundaries need flexible scheduling. However, a broad indication of the time allotment may be given for the guidance of the teachers.

This is indicated in terms of the percentage of total time to be allotted to each subject. The table showing the time allocation is given below :

<i>Class</i>	<i>Subject</i>	<i>Percentage of the total time to be allocated</i>
Classes	Language—First language	30
I & II	Mathematics	20
	Environmental Studies (Social Studies & General Science)	15
	Arts	10
	Work Experience	10
	Health, Physical Education & Games	15
	Total	100
Classes	First Language	20
III-V	Second Language	10
	Mathematics	20
	Environmental Studies I (Social Studies)	10
	Environmental Studies II (General Science)	10
	Arts	10
	Work Experience	10
	Health, Physical Education & Games	10
	Total	100

73. Allocation of Time in Classes VI-X

Upper Primary and Lower Secondary Schools should work for full six days in the week. Assuming that there would be 48 periods per week each of 30-40 minutes' duration, the instructional periods may be distributed among different subjects as below. However, individual schools may make suitable modifications, if necessary.

<i>Classes</i>	<i>Subjects</i>	<i>Periods</i>
Classes	<i>Three Languages —</i>	
VI-VIII	First language	8
	Second language	5
	Third language	3
		16
	Mathematics	7
	Science—(Life Sciences & Physical Sciences)	7
	Social Sciences—(History, Geography, Civics and Consumer Economics)	6
	Art	3
	Work Experience	4
	Physical Education & Co-Curricular activities	5
		48
	Total	48
Classes	<i>Three Languages</i>	
IX & X	First language	7
	Second language	5
	Third language	3
		15
	Mathematics	7
	Science (Physical, Chemistry and Biology, etc.)	7
	Social Sciences (History, Geography, Civics & Economics, etc.)	7
	Work Experience	4
	Art	3
	Health, Physical Education and Co-Curricular activities	5
		48
	Total	48

(The time for languages could be less, specially for first language)

V

Methodology of Education

1. Teacher-pupil activities and their organisation are crucial in the educational process. The achievement of curricular objectives is very much contingent upon their proper visualization and effective manipulation. Keeping in view the nature and background of the learner and the local conditions and available resources learning situations are to be presented in a manner that the process results in the desired learning outcomes. These situations may be both within and outside the class-room, guided or stimulated for independent action and natural or contrived.

2. The teacher is the guide, the helper, and above all, the wise friend to whom the children look gladly and confidently in case of difficulty, when they do not see the way or when they need some information. The teacher's role should be to suggest and to present, rather than command or impulse. He must show the child how to learn the subject, and how to devise his own methods of learning and organising the knowledge which he gathers or discovers. The teacher should remember that the child learns better by doing, by discovering and not by merely listening submissively to a display of factual knowledge. It is only in this active, creative process leading to discovery that the child finds interest and joy, and that concentration becomes spontaneous.

3. Quite normally, a child will have respect and admiration for his teacher. Truly, he must be an example, but not set himself up as such. On the other hand, the teacher must be aware of the disastrous influence his defects and weaknesses have on the children. When a child asks a question, he should not be answered by a rebuke or a derogatory remark under the pretext that the child cannot understand. A teacher, if he takes sufficient pains, can always make himself understood.

4. There are certain basic requirements of the learning process which the teacher has to take into consideration to evolve right approaches and methods. Proceeding from concrete to

abstract, simple to complex, known to unknown, whole to parts and easy to difficult are some of the basic axioms too well known to be dilated upon. Some other factors important for learning are as follows :

5. Experience is the key to learning. Rich experiences in actual situations give first hand knowledge of the physical phenomena. Such experiences, if coherent, integrated and consistent, reinforce each other while unconnected or compartmentalized learning experiences take greater time and interfere with each other. Moreover, experiences utilizing many aspects of child's psychological life in an integrated form have better chances of producing effective learning.

6. **Motivation is basic to learning** : The primary task in instruction is to manipulate the environment in such a way that children get stimulated to learn. It happens best when goals for learning are established in terms of children's needs to know, to master, to create, to express, to relate oneself to the world and others, etc. Incentives such as praise and recognition promote learning. Learning is further strengthened if it is applied. For this purpose the pupil is presented with problems and situations where it can use what has been learnt and derive the satisfaction of success and further gain in knowledge and skills. The thrill of acquiring new knowledge and getting satisfaction out of it is in itself a strong motivating force for higher forms of learning.

7. **Readiness is the foundation of learning** : Readiness to learn depends upon the growth and development levels of the child. The physical, intellectual and emotional levels of the child's growth provide both the limiting conditions as also the foundations for learning. Psychologists are of the view that a child is capable of acquiring much more at its level of growth than what adults consider provided it is exposed to the right type of experiences. This requires a very judicious planning and a keen eye to identify pupil's potentialities and inclinations to provide suitable experiences in the line of its motivation and level of maturity.

8. Readiness to learn acquires special significance of the context of the growing numbers in Indian schools. Many children coming from homes where parents are not educated (and this number is fairly large specially in rural areas) do not have the necessary background to be able to participate in the teaching-learning process with the same level of motivation and readiness as children from educationally advanced homes. These first generation learners need to be exposed to special preparatory classes

so as to be put in the main stream. These preparatory classes are necessary not only at the beginning of the primary classes but even at intermediate stages.

9. The above principles of learning are basic to methods, particularly for teaching young children, and cut across all subjects. In the following paragraphs an attempt has been made to outline briefly subject-wise methods and approaches at different stages of school education. It is followed equally briefly by discussions on co-curricular and independent activities.

10. **Primary stage** : Language, the most commonly used medium of communication, is best acquired through actual use. Learning to speak satisfactory forms the first step of language learning during the early years. Reading and writing skills are given the second priority for developing language and have to be taken care of by appropriate approaches. Readiness for reading language, introduction of graded vocabulary content at successive stages and using a proper sequence of structures are important ingredients of a successful method for language teaching.

11. In classes I and II, children should be given the opportunity to listen carefully to stories, narrations, recitations and formal talks. They should develop their powers of oral expression through story telling, recitation and singing of group songs, etc. The approach to teaching reading in a particular language will depend on the nature of the script of the mother tongue, its spelling system, the vocabulary interests of the children and environment. Readers for classes I and II should have material which is interesting to the children and it should be developed around their daily experience. The contents of the readers should be coordinated with the topics of environmental study for these classes and should also help to develop desirable attitudes in the children.

12. For the development of mathematical concepts the child should be helped through his experience with concrete situations in life. A discovery approach guided by the teacher should be adopted in almost all the situations. The teacher must carefully select material that stimulates children to be discovery minded and to seek patterns and generalisations. The inductive method which is based on concrete examples is very helpful in bringing home to children certain characteristics and relationships of numbers, forms and shapes.

13. Careful and well directed observation is the primary means to learning and cuts across several subjects. At the primary stage this method is of primary significance. Children

should observe vegetation and animal life around them. They should observe nature in all aspects, they should sense and feel objects, study their shapes and sizes and obtain a notion of their heaviness. They should observe objects using simple aids, things in motion and things in the process of growth like plants, animals or the human hair or nails. For the teaching of environmental studies as a composite course in classes I and II and for the teaching of natural and social sciences in classes III to V, this method is the most important, the purpose being to sharpen the senses and to enrich childrens' experience to the maximum possible extent. In classes I and II, children should be encouraged to describe their observations and experiences orally without drawing inferences and later they can be made to write accounts of the experiences they have had or express themselves through drawing a picture or writing a poem.

14. An integrated approach to teaching environmental studies is based on topics and themes rather than on the subject and children are provided opportunities to learn from situations. The teacher enjoyed greater autonomy in the organizing of such experiences as there is no rigid syllabus to be followed. The curriculum indicates the kind of knowledge, understanding, interests and values and attitudes that should be developed in the children and also gives suggestions about textual material, teaching aids, etc., to help achieve the objectives. The learning experiences are planned in terms of activities and programmes for the children. Helping children to prepare simple things from clay, taking children to the school garden and talking about flowers, organizing visit to nearby locality, measuring things available in the class or outside, discussing different seasons with reference to food, clothing and shelter and organizing festivals and exposing them to situations where they may begin to appreciate broad elements of civic and social life are just a few examples to denote the nature of activities which can form the basis of giving knowledge and skill in different areas. It may be stressed here that the activities and methods employed at this stage will help to develop appreciation among children for the value of self-sacrifice, patriotism, human brotherhood, etc. Inculcation of values though emphasised in the statement of objectives is generally paid mere lip service so far as providing learning experiences and actual attainment of values goes. So detailed planning of activities and participation by children are needed to achieve the goals. Evaluation of such attainments should also be attempted with a view to

have clear indication of the potential of a method or approach used for a special purpose.

15. **Middle stage** : The study of mother tongue will continue to aim at developing the abilities of careful listening, oral expression, reading with comprehension and written expression. Approaches at this stage should help children develop their aesthetic sense, originality and creativity, and a feeling of pride in Indian culture. Supplementary reading material to read independently for knowledge and recreation should be introduced and real interest in reading developed.

16. For the study of second and third languages, methods will be adopted according to the expected level of attainment in these languages and the characteristics of the language.

17. In Mathematics while discovery approach to teaching should still be used, question answer method can supplement direct presentation to maintain a reasonable rate of progress. While the inductive approach based on concrete situations will continue to be useful, a gradual transition from inductive to deductive is to be effected as the student reaches class VIII. This method of analysis can be introduced very usefully in training students in the skill of independent thinking and problem solving.

18. A spiral approach may be used to extend the boundaries of the subject from stage to stage and applications of mathematics and science have to be integrated throughout the curriculum in a natural way. Correlation with life around and other subjects of study should prove to be very useful and motivating to students for the study of the subject. Graphs and statistics find a natural place here.

19. For the teaching of Science from Class VI onwards, there should be gradual introduction of contrived situations. At the same time, the student should handle apparatus and perform experiments. Demonstrations by the teacher interspersed by questions and answers should help to establish properties of substances or cause-effect relationships. Concrete experiences gained through demonstration or experimentation by pupils will help the understanding of theory.

20. The student will be introduced to elements of History, Geography and Civics at this age. Effort should be made to teach these subjects from the composite social studies point of view keeping man in the focus all along.

21. It should be profitable to organise contents in terms of broad topics in Indian History, Geography or Civics and identify

major ideas and understandings under a topic to give proper focus. The values that can accrue from the study of social sciences need to be ensured by the use of special devices, activities, discussions and excursions. Children should as a result of these experiences develop love of their motherland, just pride in the achievement of a cultural synthesis from the contributions of people belonging to different regions, religions and linguistic groups. Participation in camps and projects with 'One India' as the focus will develop a feeling of tolerance and national integration. A critical look at the past and cultural and social institutions is, however, to be encouraged through raising of issues in the present social, political and economic context.

22. **Lower Secondary Stage :** While the objectives of teaching the first language remain broadly the same as at earlier stages, the expected level of attainment in the language abilities is to be pitched at higher level. For example, the student should now be able to follow lectures or talks from the radio. He should be able to express his ideas effectively in speech. He should be able to read with comprehension various forms of literary prose or to enjoy poems related to different aspects of life. Proper methods of developing these to the desired level through continuous exercise should be used. Aspects of language analysis which are conducive to better comprehension and expression should be emphasised in the teaching of grammar. Supplementary reading of short stories, biographies, etc., should be suggested and the thinking abilities in language helped through well directed exercises or assignments.

23. In the teaching of Mathematics, inductive—deductive approach will be continued with a shift of emphasis from inductive to deductive. The student will further develop analytic approach and apply it to solve problems or prove theorems. The use of independent, thinking and novel approach to solve problems or derive proof should be encouraged. A course on probability, graphs and statistics can permeate the whole curriculum in the form of spiral approach and should be integrated with sets, mapping, function and other applications. The concept of flow charts should also be introduced in mathematical situations.

24. Since the students are a little maturer to grasp theory, basic principles of chemistry, physics or biology can now be taken up. Investigatory or experimental approach is suited at this stage of learning. However, openmindedness and scepticism should be encouraged so that laws and principles are not taken for granted. Inquiry, prediction and experimentation to verify or contradict and

to discover new relationships should be the key approach to teaching science. Science club activities can be introduced to encourage innovation and improvisation.

25. The approach to teaching of history should be objective and comparative, stressing social, economic, religious and cultural aspects against the background of political developments. While teaching various aspects of life and society in different periods of history it is desirable to link the past with the present. Without suppressing historical facts, the trends towards synthesis and reconciliation should be emphasised. Conflicts and tensions need to be understood in a proper historical setting. Methods of presentation should help develop an appreciation of national and cultural heritage.

26. More independent work should be attempted by pupils through challenging assignments, group projects, debates, dramatization and history club activities. Variety of devices, charts, models, time lines, dialogues, etc., can be used to make history teaching lively and to stimulate the imagination of pupils.

27. The study of Geography should develop a sympathetic understanding of the people all over the world and their problems in the light of their varying environments. At the same time interdependence of various geographical regions and nations of the world should be brought out. The relation of growing population to natural resources and the need for conservation are also to be stressed.

28. Creating intelligent and mature citizens is the prime function of teaching civics. Methods which encourage student participation such as seminars and group discussions should be increasingly used. Children should be given opportunities for social living in camps, so as to learn how to share responsibility, to be considerate to others and to participate in decision making.

VI

Co-curricular Activities

1. The role of co-curricular activities has been duly emphasised under the discussion on development of attitudes, interests and values. It may be reiterated here that it is not possible to realize all the objectives of education without giving due weightage to co-curricular activities in the total school programmes. A well-balanced individual is one who is physically sound, mentally alert and emotionally well adjusted. Classroom instructional programmes are quite inadequate to bring about this kind of well-integrated growth. Co-curricular activities can on the one hand be utilised for supplementing what goes on in the classroom in the area of abilities, skills and social and personal traits and, on the other, provide a good soil for inculcating and nurturing various other desirable attitudes, interests and values.

2. The nature and content of co-curricular activities has to be conceived in terms of the maturity levels of the pupils. At the primary stage these activities may be more in the nature of play, free-expression of fantasy and unstructured situations so as to provide enough room for spontaneity. These activities should be interesting for the children. In higher classes the situations may become more structured and controlled leaving, of course, enough scope for creativity and spontaneity. They should also be varied enough to cater to individual needs, interests and aptitudes. Another point which has to be borne in mind is to ensure that each and every child participates in some activity or the other. As far as possible they should be left to the pupils and the teacher should perform only an advisory role in the planning and execution of such activities. This control of the situation has perforce to be remote and not immediate.

Independent Pupil Activities.

3. Pupil's personalities blossom forth in an atmosphere where they enjoy enough freedom to initiate and execute some activities on their own. The school should encourage children to go beyond the circular requirements and undertake projects and activities for the development of their special talents and interests. These are very necessary to generate self-confidence, initiative, leadership, and for the blossoming forth of the potentialities of individual pupils.

4. Independent activities provide excellent opportunity to students to acquire new knowledge as well. In projects such as those undertaken by talent students of science, pupils do acquire new knowledge, learn new methods and consult references and write out systematic reports. Such activities are also a valuable means to fostering creativity.

VII

Instructional Aids and Materials

1. A good teacher explores a wide variety of materials to find suitable aids for instruction, to supplement what the textbook provides, to add to information, to broaden concepts and to arouse interest.

2. All these sources, materials and resources that he uses are instructional aids. They may be of various types as follows :

- (i) Textbooks used in class
- (ii) General reference materials, like encyclopaedias, dictionaries, gazeteers, atlases, pamphlets and government publications
- (iii) Advanced books on the subjects taught in class
- (iv) Teachers' handbooks, teacher's edition of textbooks curriculum guides and similar materials where available
- (v) Pupils' Workbooks, programmed instructional materials and
- (vi) Audio-visual aids.

3. Selection, improvisation and use of proper instructional aids play an important part in the realisation of the instructional objectives of different subjects. It is a well-known fact that multi-media approach in instructional process leads to better learning. At the same time learning is sometimes more effective when imparted through one medium in preference to another. Multi-media-approach to teaching is now an established practice. In view of the financial constraints, it is not possible to provide all schools with the benefits of the latest developments in educational technology. However, in spite of this obvious limitation a good

teacher can certainly make instruction more effective by making a good use of the available aids and materials and also by improving some with the help of locally available raw materials.

4. No uniform policy or method can be recommended in the use of aids in the classroom. Every good teacher knows that different topics and lessons require particular types of aid and also that the teaching aids and materials vary according to the developmental needs of the particular group of children. Sometimes, verbal illustrations are the best aid to be used, in some, a picture is all that is needed, in others, a chart or a model or a blackboard diagram or a film or a film-strip. Aids should reflect the purpose in using them. The purpose may be the concretization of an idea or the inculcation of an attitude. We may use concrete objects, models, pictures and charts for the former and dramatization, role playing and simulation for the latter. So, variety must be ensured to serve specific purposes.

5. Another point to which adequate attention is not always paid relates to the collection of such materials in school. Very often, a school may feel interested in any one variety or in any one area, and consequently, other varieties or areas get neglected. It is, therefore, necessary to plan carefully the collection of aids. Materials of different varieties are to be collected so that no area or branch of the school curriculum may be neglected. Only thus can there be a balanced collection within the available resources.

VIII

Evaluation and Feedback

1. The main purpose of evaluation is to see how far the objectives set forth to be achieved through the curriculum have been realised. This process is naturally related to the learning experiences and methods of teaching that have been used in the process of instruction/learning. Evaluation, in order to be useful has to possess the following characteristics :

- (i) It should give reliable and concrete evidence on the attainment of specific objectives.
- (ii) It has to be comprehensive covering all objectives and content areas in a particular course.
- (iii) Best evaluation is possible when the teacher who has taught a course evaluates it.
- (iv) Evaluation has to employ a variety of tools, techniques: written test, practical and oral tests, observation, rating scales, etc., to test for different objectives.
- (v) Evaluation should be continuous and not at one point of time to give a reliable picture.
- (vi) Evaluation should be diagnostic to help and guide students towards higher attainments.

2. It is important that students do not develop wrong attitudes to examination/evaluation but take it in the right spirit as a means of improving their own achievement. Insistence on passing in all subjects of a course at one time and the consequent fear of failure drives many a student out of gear with studies and impedes further growth. Such a position has to be changed. There should be flexibility. The mode of evaluation has to be such that students are discouraged from rote memorisation and become competent to apply their knowledge in handling new situations and problems. Children will not work for higher types of learning like critical abilities, creativity and evaluative judgement unless such learning is attemp-

ted to be engendered through suitable experiences and is followed by proper evaluation.

3. At the primary stage children are young and tender and their rates of growth vary widely from individual to individual. No rigid system of evaluation need be imposed on them at this stage. Evaluation should be integrated with the teaching process and a system of continuous recording of progress and development of each child on the basis of observation and class tests should be developed. Promotion should not be based on the annual examination at the end of each year but on the record of progress as registered over the session. Observational techniques and informal oral tests should have greater place at this stage. Detention of students in any class on the basis of scholastic attainments should be abolished henceforth.

4. Continuous evaluation of all round development of pupils should be practised at the middle stage also. Written examination will have a place in evaluating achievement of students in subject areas and there should be a variety of ways of testing. Practical tests should be introduced. Observation, check lists, oral examination and evaluation of pupil products should be used in addition as tools and techniques of evaluation. Annual school examinations may be held but these should give adequate weightage to assessment made during the year to arrive at an objective estimate of pupil attainments in various areas. The stress should not be so much on formal tests for pass and fail as on assessment of growth for future guidance. There should not be any pass or fail. Letter grading in a five point scale may be conveniently used. What is important is to utilise this evaluation for furtherance of learning. This can be done by giving back the corrected answer books to students and discussing with them the mistakes committed by them.

5. A public examination at the end of ten years of schooling should be abolished. The school's assessment in each subject/unit should be placed on record and given to the students. A record of internal assessment covering both scholastic and non-scholastic areas without an aggregate should be included in the school certificate. The school certificate should not only mention the student's evaluation in subjects but also in co-curricular and other areas of character and personality.

6. It may be emphasised that evaluation properly practised will influence teacher's methods and the study habits of pupils. Emphasis on the assessment of understanding, application and problem solving is bound to influence instruction positively. Use of improved type of questions is a real need to dissuade pupils from resorting to rote learning.

IX

Implications for Implementation

1. Implications for the implementation of the above proposal have been discussed under the following four major heads :

A. **Machinery for implementation**

At the national level

At the State level

B. **Areas of work**

Research and development

Training and extension

Co-ordination

Clearing-house activities

C. **Implications for schools**

The school atmosphere

Provision of facilities

D. **Involvement of community**

A. Machinery for implementation

1. The infrastructure for curriculum renewal already exists both at the national and the State level. It may also be found in good institutions. However, it is desirable to define its scope and functions more explicitly with regard to this specific proposal.

At the national level

2. The National Council of Educational Research and Training is expected to develop innovative ideas in the field of curriculum and extend them to the field. With the National Institute of Education at the Centre, four Regional Colleges of Education and Field Units in different States, it should be possible for it to coordinate the work in this area in the field and also to promote and support various research and development activities related to curriculum. Further details about its specific responsibilities vis-a-vis the present proposals are being discussed under various

areas of work. Universities should also be brought into the picture and a network of curriculum development established.

At the State level

3. At the State level a number of agencies are directly or indirectly concerned with curriculum. The State Institute of Education, State Institutes of Science Education, the Boards of Secondary Education, the Textbook Bureaus, Guidance Bureaus and similar other specialised institutions are all involved in curriculum work in some form or the other. It is very necessary to co-ordinate their work and define their specific roles in so far as curriculum renewal concerned. Some States have already set up the State Councils of Educational Research and Training and others may also do this so as to provide an apex body at the State level, one of whose aims would be to look after curriculum renewal in a well-integrated fashion.

B. Areas of work

1. Any proposal for curriculum renewal has far-reaching implications touching upon different aspects of the educational process. They have to be indentified for simultaneous action on various fronts so as to make possible the achievement of the desired ends.

Research and development

2. Curriculum renewal is a continuous activity. Once a curriculum is developed and implemented it is necessary to study the process of implementation, materials and methods used and the outcomes. In the present context studies will have to be undertaken in the following areas :

- (i) Development of detailed syllabi followed by the development of materials such as textbooks, teachers' guides, workbooks, teaching aids and kits, etc., based on actual field try-out.
- (ii) Instructional techniques and methods to ensure maximum effectiveness.
- (iii) Evaluative studies to ascertain how far the objectives of general education as a whole and of various components of the process have been realised.
- (iv) Studies concerning motivation, learning, development and behaviour characteristics of children.
- (v) Studies concerning school climate, tone and roles of different functionaries in school to ensure effective learning conditions.

- (vi) Studies on the socio-psychological implication of the proposed curricular changes with specific reference to determining ways and means to ensuring effective participation of the community.
- (vii) Case-studies of individual institutions to study in depth the actual implementation.
- (viii) Studies to develop alternative curricular models so as to suit different conditions.

3. The National Council of Educational Research and Training being the apex organization in the field of school education in the country should be in a position to provide the necessary leadership in this field to initiate, promote and undertake scientific studies in various aspects stated above. It should not only co-ordinate research work going on in the States but also offer expert advice and guidance for specific studies. It should identify specific institutions capable of undertaking scientific studies in curriculum and support them. It should develop syllabi, specimen textbooks, teachers' guides, workbooks, instructional aids, kits, etc., and make them available to the States for their guidance.

4. The State Government should set up strong curriculum cells in the State Institutes of Education which should be responsible for co-ordinating, promoting and undertaking research and developmental studies at the State level. Selected teachers, colleges could be fruitfully involved in this activity. The States will also have to develop the syllabi, textbooks, workbooks, teachers-guides, instructional aids, kits, etc., suited to their conditions. They can, of course, draw upon the resources of the NCERT for sample materials and guidance.

Training and extension

5. There are new emphases given in the objectives and purposes of general education. The teacher's role is crucial in their realization. He has to develop a new outlook and equip himself with the necessary knowledge, methods and techniques. A thorough preparation of the teacher has, therefore, to be planned systematically. This has to be done both for in-service and pre-service education of teachers.

In-service teacher preparation

6. Short-term and long-term orientation courses for teachers will have to be planned to acquaint them with proposed changes in various subject areas and other school programmes, to orientate them to the new content and methods as also materials in different

curricular areas. They may also be acquainted with the various strategies which they could try for implementing maximum changes at minimum cost by exploiting the available community resources. Areas like science and work-experience will need special planning and effort.

7. The NCERT has to discharge the following important functions in this area :

Preparation of courses and materials for in-service education of teachers in different curricular areas. The latter may be in the form of resource materials, teachers' handbooks, audio-visual aids, etc.

Training of key-personnel drawn from the States.

Helping States in the development and implementation of their extension programmes of direct relevance to the proposed curricular changes.

Creating necessary climate in the State for change by organizing teachers' meets, seminars, conferences, etc. Most of this should be done in collaboration with the State agencies.

8. The State agencies on their part will have to develop comprehensive programmes for the orientation of teachers. They will have to tap various local resources for developing expertise and materials. They may undertake intensive sample surveys to ascertain local training and extension needs and provide for them. Since this programme will involve substantial financial and manpower resources as also time, it will be desirable for the State level agencies to fix priorities and phase out the programmes. Obviously in the proposed programme of curriculum renewal top priority will have to be given to work-experience and orientation of teachers in science and mathematics.

Pre-service teacher preparation

9. This is needed to meet the future needs of teachers. It is also essential to reduce pressure on in-service teacher education programmes. The needs as identified on the basis of the proposed curricular renewal are as follows :

Revising the curricula of elementary and secondary teacher education so as to reflect the new demands of the curriculum such as relating school to work, developing proper attitudes and values, integrated approach to teaching, improvisation of aids, enlisting community help, exploitation of available resources to the best advantage, etc.

Preparation of teacher educators to face this new challenge.

10. The NCERT as also the Regional Colleges of Education under it will have to play a key-role in this area. They have to undertake intensive teacher education programmes with individual States and universities and assist them in restructuring their programmes. They will also have to orient teacher educators for discharging their responsibilities more effectively. Conceptual literature and other materials on various aspects of teacher education programmes will have to be developed to make good the deficiency of such literature and materials in the field. Serious thought will have to be given to the oft-repeated charge against teacher education programmes of being unrealistic and unable to meet the demands of the school situation. Consideration of this issue has become urgent in view of the fact that the school curricula themselves are going to be geared to the needs of the community and the proverbial cleavage between school and work has to be bridged.

11. The State Departments of Education and the universities shall also have to take immediate action to revise the curricula for teacher's colleges on the above lines in collaboration with the NCERT, wherever needed.

Co-ordination

12. Curriculum renewal being a multipronged activity involving different agencies and a variety of programmes, it is very necessary to have a good co-ordination among all the agencies and programmes for an effective implementation of curriculum proposal. This co-ordination has to be both vertical and horizontal in respect of agencies as well as programmes.

13. The NCERT will have to co-ordinate the effect of its own constituent units as also of various States. This may be done through periodical conferences and meetings, developing materials and aids for the adaptation of or adoption by different States, training key-personnel for various purposes through short-term and long-term orientation and internship programmes. The services of the Field Advisers and the Regional Colleges of Education may also be utilised for this purpose.

14. At the State level itself there is a felt need for co-ordination. There are various agencies like the Directorates of Education, Boards of Secondary Education, State Institutes of Education, Textbook Bureaus dealing with curricula for different sub-stages and different curriculum components. There may be even some overlap of functions and in certain matters so much of interdependence that in the absence of proper coordination it may even lead to wastage of time and effort. It would, therefore,

be desirable to identify the functions of these various agencies in respect of this curriculum and assign the function of co-ordination to one of them. This will become easier if an agency on the lines of the NCERT is set up in each State as already done in a few States.

Clearing-house functions

15. These functions are to be discharged mainly by the NCERT at the national level. It has to collect information from various States and feed it to other States and keep the States informed about the latest developments in the area of curriculum both inside and outside the country. The States on their part would be supposed to maintain a close liaison with the NCERT in this respect on the one hand and discharge clearing-house functions for the schools and the training institutes on the other. Ultimately all worthwhile innovations and research findings acquire meaning only when transmitted to the consumer.

C. Implications of Schools

1. The implications of the new approach are far reaching for the schools. If properly implemented a complete transformation of the schools is likely to come about. There are two components to be considered from the point of view of school.

The school atmosphere

2. Operationally curriculum is not what is stated on paper but what actually happens in school. Ideally each school should have the freedom to develop its own curriculum under the broad umbrella of national objectives. Availability of resources at the local level, teachers, community needs and aspirations, support from the community, physical facilities, local, cultural and social background, job opportunities at the local level, etc., are some significant considerations for developing the school curriculum. Even within the existing social and economic constraints there is considerable scope for local initiative and involvement. The school has to create the necessary atmosphere and also make adjustments in the State-prescribed curricula to suit local conditions. Unless the school atmosphere is attractive enough to hold pupils, the problem of wastage and stagnation will continue to bug educational planners and administrators.

3. The headmaster is the key person in this business of creating attractive school atmosphere. There are two components to this atmosphere, viz.. physical and psychological. The school building may be simple yet it can be made attractive. In case

the headmaster is able to enlist the cooperation of teachers, students and parents it is not difficult to provide minimum essential facilities without incurring any exorbitant expenditure. Keeping the premises neat and tidy does not involve much cost. In this area a conscious effort on the part of the headmaster can certainly bring about the necessary transformation.

4. Psychological atmosphere of the school is equally important. It should be appealing to the child and the parents. It should lead to the development of a sense of belonging in all concerned. There should be a proper rapport among the head, teachers, pupils and guardians. Good work should not go unrecognised. Decision making should not be authoritarian. There should be flexibility in the time-table. Each child may get recognition as an individual. The staff should work as a team and not insulated from the student community. Identifying pupils' personal problems and offering assistance in solving them, showing interest in their physical well-being, having direct contact with guardians and keeping them informed about the progress of the child not only through correspondence but through personal contact, encouraging and allowing pupils to take collectively decisions on matters of common interest and in keeping with the overall objectives of the school, honouring such decisions, nipping in the bud all undesirable elements by adopting an understanding approach and above all treating the school programme as something alive are some of the basic requirements for providing a healthy psychological atmosphere.

Provision of facilities

5. The next important requirement is the provision of minimum essential facilities in schools in terms of instructional aids and equipment. In subjects like science and work-experience where each and every child is to be put through the experience of 'doing' no such experience is possible unless the children get an opportunity to handle personally apparatus and tools. Ingenious teachers can with the help of available resources make good the deficiency of certain types of aids and equipment through improvisation and help from the community. In spite of the existing financial constraints it should be possible to provide some minimum aids and equipment to the schools which may be supplemented by the above effort.

6. Provision of guidance facilities in school is also very necessary for satisfactory development of pupils. Students have to be helped in the selection of courses and in making vocational choices at the end of the period of general education. They are

to be provided with information about various vocational possibilities through career conferences and occupational corners in schools. They are to be helped in developing a realistic self-concept through individual and group counselling. Students with special talents have to be identified and provided opportunities to develop them to the maximum possible extent. For such students enrichment programmes have to be provided. Educational needs of children coming from weaker sections of the society have to be located and suitable provisions made to satisfy them. Diagnostic testing and remedial instruction is to be provided to underachievers. In addition to problems related to achievement in various subjects personal adjustment problems have to be identified and suitable remedial measures taken to overcome them. All this is possible only when adequate guidance services are provided in the schools by appointing school counsellors for individual or groups of schools, by orientating teachers to guidance activities, by enlisting the cooperation of parents and by maintaining systematic developmental records of individual pupils.

7. Another important facility needed in schools is the school health services. Although health education is provided for in the curriculum, the introduction of a regular health services programme is very necessary for the harmonious development of the pupils. In their training programmes teachers are acquainted with the broad principles of health education. With a little alertness on their part they can easily detect physical deviations from the norms such as defective vision, deficient hearing, postural oddities and speech defects and bring them to the notice of the guardians and school health officer for corrective measures. Many teachers are trained in rendering first aid. This knowledge comes handy in times of emergency. Teachers also maintain records of height, weight, etc., and this record in case of each and every individual child has to be interpreted to provide necessary guidance in deviant cases. But that is almost all that a teacher can do. In addition, provision of medical services in schools is very essential for a satisfactory implementation of school health programme.

8. There is another aspect of health services which is no less important. It is the provision of a neat and healthy school environment. The school building and compound should be clean. There should be provision for safe drinking water, disposal of refuse and clean toilet facilities. Students may also be provided with some wholesome yet inexpensive mid-day meal.

D. The involvement of community

1. This is yet another very important consideration for the successful implementation of the proposed curriculum. It has been considered necessary for a variety of reasons. The present cleavage between the school and the community came about at a time when admissions were selective and the school was to serve not the community but the rulers. Though times have changed yet the cleavage persists. The community has to realise that the school is to serve their needs, that it is not an institution imposed upon them from outside, that education of their children is necessary for the prosperity of the community, that there is no difference between them and the government and therefore they are the real masters of the institution. Unless this realisation comes and the existing prejudices against the school-master and educational authorities removed and a good working relationship developed between the community and the school there is very little hope for a successful implementation of any improvement programme. For this purpose the attitude of the teacher has also to change. A sincere teacher can surely make the school a centre of community activities. The community, in its turn, can provide facilities in men and material through its own effort for nurturing the school.

2. With the change of attitudes and active participation of the community in the welfare of the school it may be possible to utilize the locally available talent for various aspects of the curriculum, specially in the area of work-experience. The community could also be helpful in providing other physical facilities for the school. Once the community accepts an institution as its own and realizes the value of education, many of the present problems being faced at the moment, particularly at the primary level, will automatically vanish.

1. To sum up, an effort has been made in the foregoing pages to justify the need for a broad-based system of general education for the first ten classes of schools in India. While doing so, the present weaknesses of the system and the growing future needs of industry and society have been kept in view. The curricular areas and the new emphases that are called for have been indicated stage-wise, giving due weightage to areas neglected so far, viz., those of work-experience, art and physical education. In the area of languages, the proposal caters for the 3-language formula, while in the areas of Science and Maths, stress has been laid both on the content which find application in life as also on the processes and methods of learning on one's own. A scheme of allocating time in the school timetable to different areas of study stage-wise has been presented as only suggestive. The need for a new focus on the development of attitudes, interests and values has been emphasised alongwith the ways in which the same can be developed in relation to the study of different subjects and through participation of pupils in well-designed individual and group activities. For judging the outcomes of learning, the scheme of evaluation proposed here makes internal assessment by the teacher pivotal so that the progress of the pupil can be continually assessed and suitable action for diagnosing his difficulties, if any, and remedying them can be taken.

2. In the end, some suggestions have been offered for a successful implementation of the scheme of curriculum renewal highlighting the implications it has for the preparation of the teachers, the research and coordination effort that is required on a permanent basis both at the national and State levels and the involvement of the community in serving the needs of their schools. It is hoped that as a result of the implementation of this curriculum, the products of the system will prove to be better workers and citizens and will be in a position to contribute their mite to the social and economic development of the country.