

2013

# THE CURRICULUM FOR THE TEN-YEAR SCHOOL

36

*A Framework*

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**National Council of Educational Research and Training**

# The Curriculum for The Ten-Year School

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**National Council of Educational Research and Training**

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## Foreword

The nascent Indian society is replacing old ideals by new. The Report of the Education Commission (1964-66) underlines national development as one of the most important concerns of education and, in fact, visualizes it as the only instrument of peaceful social "change on a grand scale". The Commission's report was discussed in the Parliament and a Policy Resolution was adopted by the Government of India in 1968 in which the main recommendations of the Commission were accepted.

Admittedly the task of developing a corresponding curriculum which by way of its objectives, content and methodology serves the current and emerging needs of the Indian society and the citizen is complex. In a large country, with diverse languages, cultures and traditions, where education is a State subject, the necessity of evolving a national consensus on the curricular framework makes the task even more difficult. However, during the last few years, as a result of many discussions at different levels involving experts from various fields, a framework has emerged which is being presented in this document. In spite of the fact that perfection or finality can never be achieved in the curriculum, since it is associated with everything that is dynamic, the moment has come to make the present framework the starting point of a serious effort to implement the ideas and the consequential tasks. The thrill of a continuing academic discussion has to be replaced by the excitement of action; otherwise, the object of the discussion will be lost.

The National Council of Educational Research and Training expresses its gratitude to the numerous educationists who have contributed to the making of this document. A special mention has to be made of the interest taken by the President of the Council, Prof. Nurul Hasan, and of the guidance which he gave to the work from its inception to its completion. His speeches at the first meeting of the expert group and at the conference at which these ideas were finalized were both invaluable contributions to the crystallization of ideas. It is hoped that this document will serve as a useful guide in remoulding education for national development in the years to come.

New Delhi  
14 November 1975

Rais Ahmed  
Director  
National Council of Educational Research  
and Training

## The Curriculum Committee

The Ministry of Education and Social Welfare constituted an expert group in 1973 to develop the curriculum for the 10+2 pattern. This group was expanded in 1974 to include the experts from within the NCERT which had drafted a version of the curriculum in 1972 and revised it in 1973. A number of sub-committees were appointed for different subject areas, and in the course of this work many other educationists were consulted. An Approach Paper was then drafted and circulated for comments to all the States and to many other teachers, educational administrators, and individual educationists in March-April 1975. Finally, a national conference on the curriculum was convened in Delhi in August 1975 to discuss the draft. It was attended by about 200 educationists from all over the country. The present document is the result of all these endeavours to have as wide a consultation as possible and perhaps represents the largest measure of common understanding which is possible in such a matter. It is not possible to name all the people who have contributed very significantly to this framework of the curriculum and to whom we are indebted but a list of members of the enlarged committee is given below.

- |                                 |   |
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## *Introduction*

1.1 The school curriculum of a country, like its Constitution, reflects the ethos of that country as also its chief concerns. Time and again it has been pointed out by our national leaders that the vestigial remains of a colonial-feudal system of education historically meant for the production of clerks should be thrown out of the system and the system revamped to respond to the growing needs, aspirations and demands of a modernizing egalitarian society. In his system of Basic Education, Mahatma Gandhi gave an alternative approach which could help the development of a system in tune with the Indian society. The Report of the Education Commission (1964-66) incorporates the best that Basic Education has to offer, and lays emphasis on the "internal transformation" of education so as to relate it to the life, needs and aspirations of the nation. The values enshrined in our Constitution point towards the development of a pluralist open society and a state which is secular, democratic and socialist in nature. The school curriculum should reflect these aims and values in its structure, content, implied methodology—in fact, in its entire design.

1.2 It is not, however, easy to bring about a change in the existing system of school education so as to meet the requirements of national development implied by the statements made in the paragraph above. It is going to be increasingly difficult to provide good education in the country's schools under the mounting pressure of the growing number of children. But the task is made even more difficult by rigid postures and orthodox attitudes. It is necessary to understand that new ways have to be found of teaching and learning, that non-formal education in our society is a rich source of learning and should be utilized, and that an all-round flexibility in the school will have to be introduced—in the courses of studies, methods and materials of teaching and learning, evaluation, the time-table, admission policies and practices, the administration of the school system as well as of individual schools, the preparation and in-service education of teachers, the utilization of resources in the community, and such

other things. Thus, multiple entry into the school, part-time education in the school, non-formal education outside the school, and teaching by the experienced worker, artisan, artist and writer in the school should be all tried out. Nothing short of a total learning system involving the optimum use of resources in both men and materials, inside the school as well as in the community outside the school, can meet the growing demands of education today.

Here, however, we shall pay attention to only the important aspects of the development of the curriculum for the first ten years in school, from Classes I to X.



## II

### *Salient Recommendations*

#### 2.1 Flexibility within a Framework of Acceptable Principles and Values.

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 the other. 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 the other. 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. This means that the educational system of a State (as well as at the Centre) has to have a built-in mechanism for curriculum renewal.

#### 2.2 Curriculum Related to the Life, Needs and Aspirations of the People.

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 national integration, social justice, productivity, modernization of the society and cultivation of normal and spiritual values.

### 2.3 Science and Mathematics for Productivity and a Rational Outlook.

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 continually renewed in order to give our children modern knowledge, develop their curiosity, teach them the scientific method of inquiry and prepare them for competent participation in a changing society and culture, increasingly dependent on a rational outlook leading to better utilization of science and technology.

**2.4.1 Work Experience as a Source of Learning.** Work experience should be a central feature of school education at all levels. It should be oriented to the application of science and technology and to productive processes in agriculture and industry. Work experience should provide an opportunity to learn from the use of the hands, give insight into the material phenomena and human relationships involved in any organized productive work, create the attitudes necessary for cooperative accomplishment of tasks and discharging of social responsibility within a framework of equality as well as of the freedom of the human spirit.

**2.4.2** The report of the International Commission on Education (UNESCO), entitled *Learning To Be*, shows 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 an opportunity for further education. This dichotomy between work and education is unnatural and should be broken. The school time-table, courses of study, methods of instruction, examination, certification—as a matter of fact, all aspects of the school—need to be flexible so as to bring the school closer to the community. Only thus will the school be able to promote equalization of educational opportunities and bridge the gulf between education for the elite and that for the masses.

### 2.5 Concern for Social Justice, Democratic Values and National Integration.

The awakening of social consciousness, the development of democratic values and of a feeling for social justice and national integration are extremely important. The promotion of national consciousness and the development of international understanding should be one simultaneous process. Tolerance, friendship, cooperation and peace between nations are 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. Discrimination of any kind based on sex, caste, religion, language or region is to be looked at with aversion because it is irrational, unnatural and harmful to the growth of modern India. All subjects should be taught in such a manner

as to foster the spirit of scientific humanism.

**2.6 The Three Language Formula.** The three language formula should be implemented with sincerity, and, so far as possible, primary education should be in the mother tongue. 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.

**2.7 Artistic Experience and Expression.** 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 and make use of his gifts, aptitudes and personal forms of expression.

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

**2.9.1 Character Building and Human Values.** 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 the 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 child to discover its potentialities. Educational activity should be organized 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.

**2.9.2** Linked with this process of character building is the cultivation of such basic qualities as compassion, endurance, courage, decision-making, resourcefulness, respect for others, the team spirit, truthfulness, faithfulness, loyalty to duty and the common good. These can be encouraged by all curricular activity and particularly 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.

**2.10 Implications of the Process of Learning.** The UNESCO report *Learning To Be* emphasizes the process of learning, and particularly self-learning. The methods of teaching should change in the direction of helping individuals to learn better and on their own, not only in the school but also 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 infor-

mation doled out to it. In this matter it is necessary, particularly, to emphasize 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 de-motivate 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 the physical, intellectual and emotional areas of growth. Although social intervention during such growth may help, children are not infinitely malleable. In cognitive development, the mastery of subject matter is not as important as the modalities of the learning process. The teaching-learning situation, therefore, should be so arranged as to give the child the experience of actively solving 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 the curriculum should not be structured at all; it only means that the 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 minimized 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 interest and allow him to develop and learn at his own pace.

**2.12 Drop-out and Multiple Entry.** There are some other aspects of the 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 school. While attempts are being made to develop part-time education and non-formal education, it is necessary to make suitable improvements in the organization of school education like changing the admission requirements and school hours (to fit into the pattern of harvesting or other productive work) so as to facilitate entry at different stages for those who come from non-formal programmes, and to reduce the number of those who cannot keep up with the school.

**2.13 The Semester System.** Likewise it would be desirable to change the present courses of studies, which tend to be uniform for everybody and by their duration of a full academic year tend to contribute towards inflexibility of the disciplines and channels of progress for individuals. Instead, semester-length courses would improve the teaching-learning situation and also reduce the burden of the end-of-course evaluation.

**2.14 Units within Semester Courses.** Reduction of inflexibility as well as improvement in learning and evaluation would also be promoted by dividing the entire course of studies for a given class over various "subjects" into smaller units. A proper sequence of units in the teaching-learning process could be established for the most meaningful, logical and, therefore, economical approach

to the concerned subjects. By this approach the many-sided nature of knowledge will become self-evident to the learner, which is something that he completely misses while examining problems and situations from the narrow angle of a single "discipline". In fact, even an examination of problems in depth in later years often turns out to be an exercise in interdisciplinary study. Another advantage is that areas such as health, sanitation, nutrition, population studies, pollution, water resources, elements of psychology and culture, which have to find a place in the modern curriculum and which are multi-disciplinary, would be dealt with more easily through a unit approach.

**2.15 The Core Curriculum and Beyond.** It is visualized that the details of a core curriculum based on these objectives and ideas will be drawn up and offered by all secondary schools in their programme of general studies. However, the special needs of the talented, the backward and those coming from non-formal channels have to be looked into. Where possible, schools should provide additional units for those who are keenly interested in, say, mathematics, or home science, or painting, etc., or those who offer to study one or another advanced unit. Students coming from the less fortunate schools or from non-formal education may also need remedial units or bridging units which particular schools would have to provide.

**2.16 Evaluation.** Whereas in the present system either there is promotion for all students without examination, or there is an annual examination covering all the courses inducing the child to cram a large mass of half-digested information in a short time and thereafter forget it conveniently, what is necessary is to bring out clearly the specific goals of education in the form of expected outcomes of learning at each stage, and then, in relation to these outcomes, offer courses of studies in the form of sequences of units. Each unit could then be evaluated separately thereby reducing the burden of the examination at the end. The necessary variety of tools and techniques should be employed to evaluate not only the performance of the learner but of the process itself. The deficiencies discovered must be removed as far as possible by remedial courses, if necessary, rather than "failing" students by way of punishment. Gradually, as the system of internal assessment takes root, and personal biases leading to the lowering of standards are brought under check, the external public examination even at the end of Class X will become redundant and should be abolished. It would be necessary for each Board/State to evolve a phased programme of accomplishing this.

**2.17.1 Textbooks and Supplementary Material.** Textbooks have to be considered in the light of the suggestions in this document that, particularly for primary classes, it is far more important to prepare teachers' guides and supplementary materials, and that the broad aims and objects of education have to be covered by each subject area in its own specific way. The questions pertaining to social justice or national integration, for example, have to be dealt with imaginatively but not only in books in social studies or history and civics.

The question of attitudes, such as attitude towards equality of sexes, or towards untouchability, for example, is capable of being dealt with with equal force in the social sciences and the natural sciences. The textbooks must not only inform the reader but also rouse his curiosity to learn and investigate; this curiosity, in turn, should be satisfied by suitable supplementary readers. Therefore the new approach to the curriculum will have to be explained to authors and publishers so that both textbooks and other materials can play their expected part in the educational process.

**2.17.2** The idea of units explained here lends itself to two very useful possibilities. One is that the units for a particular class or year of study could be put together in one volume, to serve as a book or textbook, thereby reducing the load and number of books for a student to a minimum. The other is that with the unit approach it may be possible to establish a set of commonly accepted units for the whole country. The shortage of paper, and of funds in general, on the one hand, and the necessity of printing books in several languages within each State, on the other, has already led educationists to explore the possibilities of a common core curriculum. A commonly accepted framework of ideals and educational aims may reinforce this desire. The books may thus have some common units and some units specifically meant for and produced by a State. There may also be units which generally do not change rapidly with time, such as those in physics, or in history up to the achieving of independence, and units which change with time, dealing with such items as man's progress in exploring the universe, or the Constitution of India. Obviously, these problems require new thinking.

**2.18.1 Need for Coordination and Collaboration.** If the ten-year school curriculum has to develop along the lines noted above, it will be necessary to utilize 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.

**2.18.2** The harmonious and judicious blending of a certain amount of uniformity and a fair amount of flexibility in the curriculum should be based on careful thought since there are different levels of development, sub-cultures, regional differences and the like. Within a broad common framework, an attempt should be made to promote flexibility in approach by giving more freedom to the teacher to bring to bear his individuality and by encouraging individualization of instruction. It is in this context that the proposals regarding environmental education, providing guidelines to the teacher on evaluation and assessment, teacher participation in curriculum development, encouraging a spirit of innovation and experimentation on the part of the teachers and local

school systems under the school complexes scheme, greater use of local resources, involvement of the local community and the revision of curricula of teacher training institutions must be viewed.

2.18.3 A curriculum may be regarded as the sum total of all the deliberately planned set of educational experiences provided to the child by the school. As such it is concerned with

- (i) the general objectives of education at a particular stage or class
- (ii) subject-wise instructional objectives and content
- (iii) courses of studies and time allocation
- (iv) teaching-learning experiences
- (v) instructional aids and materials
- (vi) evaluation of learning outcomes and feedback to pupils, teachers and parents.

2.19 **Development and Research.** 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. A well thought out and phased programme for the development of a ten-year curriculum should be worked out carefully, considering all the aspects of implementation in the school system of a State or Union Territory.

### III

#### *Stage-wise Objectives of General Education*

3.1 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**

3.2 This stage of education covers, roughly, the children of age 6+ to 11+ studying in Classes I to V. In some parts the age may be 5+ to 10+. In some cases the classes may be I to IV and age in years may be 5 to 9 or 6 to 10. But the generalization which follows will hold. This is a very crucial stage in the life of a child. 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. The curriculum should take into consideration the social, intellectual, emotional and physical maturity of the child as well as the socio-economic needs of the community. 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. It should be pointed out here that for a number of children the primary stage is terminal. It should, therefore, be necessary to provide an education to them which prepares them for life and for self-learning. The objectives of education at this stage may be stated as follows:

- 3.2.1 The first objective is *literacy*. The child should learn the first language, which would generally be his mother tongue, to a level where he can communicate easily with others through properly articulated speech and in writing.
- 3.2.2 The second objective is attainment of *numeracy*. The child should develop facility in the four fundamental numerical opera-



- tions and be able to apply these in the life of the community to solve practical problems.
- 3.2.3 The third objective is *techniracy*. The child should learn the method of inquiry in science and should begin to appreciate science and technology in the life and world around it.
- 3.2.4 The child should develop a respect for national symbols, like the flag and the anthem, and for the democratic processes and institutions of the country. He should know about the composite and plural culture of India and learn to denigrate untouchability, casteism and communalism.
- 3.2.5 The child should acquire healthy attitudes towards human labour and its dignity.
- 3.2.6 The child should develop habits of cleanliness and healthful living and an understanding of the proper sanitation and hygiene of its neighbourhood.
- 3.2.7 The child should acquire a taste for the good and the beautiful and should take care of its surroundings.
- 3.2.8 The child should learn to cooperate with others and appreciate the usefulness of working together for the common good. Other desirable qualities of character and personality such as 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.
- 3.2.9 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

3.3.1 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 this period can become difficult for many children. Problems of adjustment in the family, the school and the society begin to appear. The child, however, becomes 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. For many boys and girls, this stage is terminal after which they enter life and work. They should, therefore, be prepared adequately to face life and develop capacities and attitudes for productive work in which they have to participate.

3.3.2 Thus, in the matter of national integration, the children should now develop an understanding based on knowledge, through a proper study of history, geography and other subjects. 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 should be deepened and widened by their knowledge of world culture and

civilization.

3.3.3 This is the stage when a second language should be learnt so that the child is prepared for wider participation in society and the nation. The child should begin to comprehend ordinary speech in that language as well as simple pieces of writing in prose and poetry. Its mastery of the first language, however, should now be greater and the child should begin to appreciate its literature.

3.3.4 In the sciences, physical and life sciences 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 emphasize agricultural and technological processes and tools to help the integration of science, mathematics and technology with production and with the life of the community.

#### Objectives of Lower Secondary Education

3.4.1 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 up vocational courses, and (c) they can take up higher level academic courses of study to prepare for entrance to 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 that should have started from the middle stage should be accelerated and brought to a satisfactory level of development. The Education Commission had thought of a 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 these 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 the child some psychological insight into his problems and the knowledge that may help him to understand his own behaviour as well as that of others around

lim. }

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

3.4.3 The student should have acquired by now the knowledge and skills required for entry into an area of work. He should have learnt one or two useful trades. But it is equally important to give him enough knowledge of the materials, tools, techniques and processes of a job family so that he can enter life with some confidence.

3.4.4 The first language should be learnt up to a point where some of the best specimens of literature in that language can be appreciated and a beginning made in creative writing. The second language should be learnt up to a level where one can adequately express oneself in that language. A third language should be learnt up to a point where the student can have reading comprehension of ordinary passages, and expression.

3.4.5 Apart from learning the other subjects like history and geography, the student should develop an understanding of the social and cultural phenomena, not only in India but in other countries of the world, and particularly of our neighbours. Through curricular and co-curricular activities, physical education, games and sports he should develop desirable social attitudes and values like those of kindness, cooperation, the 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 Content*

4.1 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 objectives are to be realized through each subject, what methods and materials are to be used 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 the distribution of time over the various curricular areas need to be thought out. What should be evaluated, how often, by whom, and by what method also needs thinking over. Here we shall discuss the objectives and content of different curricular areas, and only some indications will be given for the guidance of curriculum workers.

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

- (i) The sciences
- (ii) Mathematics
- (iii) Work experience
- (iv) The social sciences
- (v) Languages
- (vi) Art, music and other aesthetic activities
- (vii) Health and physical education

4.3 The above list should not be taken to be exhaustive of all that can or should be given in a school. Other experiences should be available to students through co-curricular programmes and supplementary reading. By developing a system of semesters in each of which there will be several units of courses for instruction and evaluation, much flexibility can be introduced into the school system and opportunities can be provided for expression of diverse

interests and abilities. Especially for the children from the backward sections of the society, as also for the talented, such a flexible system would allow for provision of special types of courses. Multiple-entry and part-time education would also be easier in this system. The emphasis, however, should be on the process of learning rather than on a routine drill of textbook materials and exercises. It is important to involve the teachers in the preparation of instructional materials for particular units. There should be few textbooks during 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 interdisciplinary approach in the development of units. Language learning, for example, should not be considered to be taking place only in language classes. Much of it goes on while learning other subjects also. An attempt should be made to develop Pioneer Palace type of activities for children; these activities will be self-selected and will help in the development of their personality.

### The Sciences

4.4 There is 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 the land or from industry, the power of modern weapons or the speed of transportation of ground and air forces. In the present situation, therefore, anyone, in any walk of life, must be aware of a 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, of designing experiments, of applying reason as well as imagination to draw conclusions from data to formulate theories, the method of keeping an objective view while theories are tested is a method which pervades every discipline. The 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.

4.5 Science should help in reducing obscurantism and all sorts of prejudices based on sex, caste, religion, language or region. By emphasizing a rational approach science should help the development of a democratic, secular and socialist state.

4.6 In the primary classes, the sciences should be taught as environmental studies; in Classes I and II as a composite course including both the natural and the social environment, and later on as two subjects, viz., environmental stu-

dies 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. The purpose should be not to stuff the minds of children with facts and information, but to sharpen their senses, to enable them to observe their environment and to enrich their experience.

4.7 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 also on the solid foundations of experience drawn from the environment of the child. In such a programme an inflexible syllabus cannot be drawn up for all the schools. In fact, there is some point in the criticism that our science textbooks have, generally, an urban bias. The textbook may not be given so much importance in the learning of science. What is really important at this stage is to provide teachers with guides and allow them to develop their own instructional material. However, reading materials for children should be very thoughtfully prepared so as to motivate them to learn.

4.8 In the age-group 11+ to 14+ (Classes VI to VIII) a number of States have already gone ahead with the introduction of physics, chemistry and biology as disciplines. Some other States could develop integrated courses up to Class VIII. Some of the States could also try with groups, e.g., physical sciences, including physics and chemistry, and life sciences, including botany, zoology and human physiology. The unit approach, which does not violate the disciplines, and actually brings them closer and provides a more logical and economical procedure, has a great potential and should be adopted. 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. Open-mindedness and scepticism should be encouraged.

### Mathematics

4.9 Mathematics has helped man to quantify ideas, to be precise and to utilize spatial concepts in his day-to-day living. Its place in the sciences and in the practical arts, from the informational and computational standpoints, as well as its cultural significance, make it indispensable in our life. In a society which is rapidly transforming itself into an industrial and technological society, mathematical literacy is essential for every citizen. The objectives of mathematics education at the school stage should be:

- 4.9.1 To enable the 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, generalizing them, trying to find

proofs and making abstractions, etc.

4.9.2 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.

4.9.3 To enable the students to learn the basic structures of mathematics through unifying concepts and to motivate the learning of structures through applications and concrete situations.

4.9.4 To stimulate the students to study mathematics on their own and to develop a taste and feeling for mathematics.

4.10 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.

4.11 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. But this does not rule out the possibility of offering some units at higher level for talented students.

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

4.13 At the middle stage, the number system will be extended to real numbers as also the operations. The student should be made familiar with the language of algebra and linear equations, and inequalities in one or two variables introduced. The concept of sets and their notations, as also the elementary concepts of statistics, should be developed. The 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.

4.14 In Classes IX and X, real-life problems should be handled by the students. The knowledge of algebraic processes should be systematized and extended. The idea of proof should be developed and elementary theorems on triangles, parallelograms and circles taken up. The introduction of trigonometric ratios and the use of descriptive statistics along with measures of central tendency and dispersion should be made at this stage. The history of mathematics with special reference to India and the nature of mathematical thinking should permeate the entire course.

#### Work Experience

4.15 For 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 his hands and develop proper attitudes towards manual labour. In addition, there is an urgent need to bridge the gap between the world of school and the world of work. This gap will widen further, if not controlled early, due to the modern technological developments and the increasingly technology-based society of the future. Processes and skills of work are changing. An early initiation of children into these is possible only through work experience. That is why the Education Commission (1964-66) made a strong case for introducing work experience as an essential component of general education at all stages of school education. As a matter of fact, the work-experience approach should permeate the entire curriculum.

4.16 Work experience provides the basis for the development of knowledge, skills and attitudes useful for later participation in productive work. Work experience should cover production, maintenance and the technological processes, as well as human relations, organization and management and marketing. The areas of work chosen should have local significance and should be such as to develop the competence of the students. It is not just learning to do work, it is work education.

4.17 Work experience programmes can serve the following objectives. Their main purpose should be to develop proper attitudes towards work, to inculcate dignity of labour, banish status and class distinctions, and to stress the principle of productivity. Wherever possible, work experience should help to appreciate the need for and usefulness of labour-saving devices, gadgets, tools, that are so much a part of modern life, and the techniques involved in their use and the underlying scientific principles. Various activities of work experience must necessarily be related to the community needs and its services. A carefully directed work experience programme would also help to discover the aptitude of a student for gainful vocations which demand certain types of skills, physical ability, attitudes towards others with whom they have to work and responsibility in performing their jobs and discharging their duties.

4.18 At the primary stage, work experience should begin with simple, creative, self-expressional activities performed with locally available material and simple tools. It is desirable to avoid any activity with an element of monotony in it. In the upper primary (or middle) and secondary classes, the use of tools should be introduced in a scientific manner.

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

4.20 In order to give the students some experience in a number of areas of work, it is suggested that one area of work may be offered in one semester, another area in another semester, and so on.



4.21 Students may be given the chance of specializing in a particular area of work by following it successively at different levels. Such specialization could help in doing a regular job, either after Class VIII or after Class X. It would be desirable to provide some experience in Classes IX and X of working in a farm, a factory or such other establishment of work which may be available in the community.

4.22 The actual areas of work which should be included in the curriculum would be governed by local needs but the areas of work should cover the various processes, techniques and tools of work, as far as possible.

4.23 Work experience should be aimed at providing experiences which are not otherwise provided in the curriculum. It has implications for the teaching and learning of school subjects and provides a basis for integrating knowledge. Well organized work experience may, from the higher primary stage, result in some earning for the student, either in cash or in kind, and this potentiality should be exploited where possible.

#### The Social Sciences

4.24 The major objective of the study of the social sciences is to acquaint the child with his past and present geographical and social environment. An effective programme of teaching of the social sciences in schools should help the pupils to take a 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, social values and attitudes. These are essential to enable the growing citizen of tomorrow to participate effectively in the affairs of the community, the state, the country, and the world at large.

4.25 The teaching of the 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, chauvinistic and obscurantist 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 the 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 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 the knowledge 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.

4.26 The study of the social sciences in Classes I-X should 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 would 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 the individual disciplines. This would require identifying the essential units in each of the subjects and then unifying them into an integrated syllabus for the social sciences.

4.27 Since Classes V, VIII and X are the terminal classes for a large number of students, it is necessary to develop self-contained courses of study for each stage, and at the same time the courses should be such as to lay the foundations for the subsequent stage. While following this principle, it is also necessary to avoid repetition and waste of time and energy as far as possible.

4.28 **The Primary Stage.** The social sciences should be taught as a part of the study of the environment in Classes I and II and as the independent subject of social studies in subsequent classes. 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 the physical, social and cultural elements. While presenting facts from all these areas, the primary concern of the school at this stage should be to develop the 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.

4.29 During the five years of primary school the child's mental horizon would be gradually widened from the home, the school and the local community to the world. In the process, the child would begin to appreciate the geographical elements of his environment. Various human activities, which help him to understand how the gifts of nature are processed to produce goods for serving the various needs of man, would also be studied. He would also get an idea of the social and cultural life in different parts of the country as well as of some 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 becoming broadly acquainted with the functioning of political and social institutions.

4.30 **The Middle and Lower Secondary Stages.** For the organization of content in social sciences, comprising history, geography, civics and economics, in the next two stages of school education, three different approaches can be visualized:

- 4.30.1 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.

- 4.30.2 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.
- 4.30.3 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 the isolation of the disciplines amongst themselves and of disciplines from problems or situations, in the third approach 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 may be introduced in each subject so as to lead to a slightly more advanced integrated syllabus in these subjects. While selecting units from individual subjects care may be taken to preserve the general structure of the discipline and include those facts and principles which are useful to a growing adolescent and serve as a base for a systematic study of the subject subsequently. The scope of different subject areas as visualized at the middle and lower secondary stages is given below.

4.31 History at the middle stage should acquaint the pupils with the growth of Indian society from 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.

4.32 The organization 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 chronological order, 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.

4.33 It is suggested that the class-wise distribution of the Indian history syllabus may be as follows: Class VI—Ancient India; Class VII—Medieval India; 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.

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

4.35 The course envisages the study of local government and the Indian Constitution in Classes VI and VII, respectively; and in the last year, i.e., in Class VIII, 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 to adopt a functional and integrated approach.

4.36 Though many of the activities and topics of study included under this scheme may be organized 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 classroom and involved in real life situations.

4.37 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 values, 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.

4.38 At the middle school stage, the course would necessarily be more descriptive and, within the broad framework, would concentrate on imparting knowledge about India in the context of the world, which we have to share with other peoples, characterized by their diverse ways of living. It should bring home to the pupils the interdependence of the 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.

4.39 For successful living in a developing society where socio-economic changes are occurring rapidly, it will be helpful if some rudimentary understanding of the 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 the effects of increasing population, in a very simplified form.

4.40 A systematic course in the history of mankind from prehistoric 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 a certain unity and distinctiveness along with many diversities. The main basis of the selection of these 'patches' may be the successive stages 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 the 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.

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

4.42 In Classes IX and X, 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 UNO is playing a significant role in strengthening world peace and cooperation should also be promoted.

4.43 From this point of view the course in Class IX should include the meaning and 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 the UNO in maintaining world peace. Some basic elements of sociology should also be introduced.

4.44 At the terminal stage of general education the subject of geography should shift its emphasis from the mere descriptive to the 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 world geography and the economic geography of India should also be undertaken, besides a brief analytical study of all the different aspects of the same.

4.45 The approach to the teaching of economics at the lower secondary stage should emphasize not so much the principles of economics as the current problems and issues that affect the everyday life of the common man. While doing so, some light should, 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.

4.46 The course should include a brief review of the economic conditions of India at the start of British Rule. This should prepare the ground to understand the need for the economic development of India through the National Plans and help to appreciate their objectives. As a part of his introduction to economic institutions, the child should 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.

4.47 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

4.48 The three language formula has been accepted as the national policy. A child at the completion of ten years of school should be competent in the first language, be able to understand and express himself in the second language and be able to comprehend the third language in its ordinary printed form. The first language should usually be the mother tongue. The second language should be Hindi where it is not the mother tongue. 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, or introduced separately as a fourth subject.

4.49 By the end of the primary stage, the pupil should have acquired the competence to express orally, as also in writing, through the standard form of the mother tongue, correctly, within the limits of the 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. He should be able to listen with comprehension simple narrations at his level. At the middle and secondary stages a greater enrichment of all the above skills through more advanced linguistic and ideational content is expected.

4.50 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 a 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 and interests, the basic human values like compassion, honesty, tolerance, truthfulness, national consciousness, a sense of discrimination and the spirit of enquiry.

4.51 The second language may be introduced in the primary stage or in the middle stage. The third language could 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 cul-

ture of the people concerned. Oral-aural techniques of language teaching should be introduced.

4.52 No language should be treated as an optional and non-examinable subject 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**

4.53 Art education begins with creative aesthetic activities. 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, and taught to love the 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, commonplace 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.

4.54 The teaching of the different arts—dance, music, painting, etc.—should be based on the same fundamental principle of giving to the student an opportunity for perfecting his own capacities and of helping and encouraging him in the process.

4.55 Art education is a neglected area in the school curriculum. Whatever little art education is imparted, the emphasis is on the learning of skills, whereas the goal of art education should be to develop the aesthetic attitude which permeates all activities and not only the learning of the skills of the arts.

4.56 The attitude to the arts in the educational system is full of prejudice; the arts are supposed to be intended for the drop-outs 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 the handful who may be extraordinary in either singing or painting.

4.57 The purpose of art as a teaching subject has to be re-defined. The old concept of teaching the skill of drawing should be dispensed with. The child should be considered as the centre of all creativity, and artistic expression (so natural to his instincts) should be encouraged.

4.58 The principle of "learning by doing" which forms the basis 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, feeling and, finally, in doing.

4.59 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 subjects to be included are the fine arts, music, dance and drama. The instruction should revolve around the relationship of the child with his environment, both within and without. The teaching approach should be such as to provide to the child the maximum enrichment materials for developing his liking and understanding about them.

4.60 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 mobilize 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. The individual style of the child should be encouraged and respected. The topics suggested should be related to his experience.

4.61 The secondary stage is a transitional period between the creative expression of childhood and the vocation-based training of the later period. Here again, as before, direct instruction 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**

4.62 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 emphasizes that the development of the total personality and achievement of worthy citizenship motivated for service should be the outcomes of physical education.

4.63 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 been accumulated. It includes the acquisition of good habits 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 should be developed but the skill, dexterity and endurance, which sports and games develop, and which are an excellent preparation for many occupations, should also be encouraged.
- (iii) Training of the senses. It should be the aim to develop a quick per-



- ception of the eye and ear and a quick response of all the parts of the body to any call made upon them and a coordination and mastery over the reflexes, as for instance in gymnastics and balancing.
- (iv) Not only strength, but also grace, beauty and harmony should be pursued. Beauty is not a superfluity but the very spirit of the physical world.
  - (v) Self-mastery and discipline, and courage and confidence should be cultivated. To control one's impulses, reactions and weaknesses is a very important gain brought about by the practice of athletics, games and yoga.
  - (vi) Cooperation, impartiality and fair dealings with others. These are especially developed by team games.

4.64 A well planned programme of physical education, scouting, guiding, NCC, etc., can be of help for the cultivation of such basic qualities as endurance, courage, decision-making, resourcefulness, respect for others, truthfulness, faithfulness, loyalty to duty, and the common good. Some of these activities may be in addition to the compulsory programme of physical education.

4.65 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 the primary to the lower secondary school stage of education, to spot out talent in sports and games and provide opportunities for nurturing this talent.

4.66 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 service, scouting and guiding, NCC, and the like may be in addition to the core and compulsory programme of physical education.

4.67 The warmer hours of the day should be avoided for physical activities programmes. The morning and evening hours are the most suitable. The hours would differ from season to season. Local climatic conditions should also be taken into account while providing periods in the time-table and preparing programmes for tournaments, competitions, etc., under physical education.

4.68 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.

#### Areas of School Work and Time Allocation

4.69 It has been pointed out earlier that in order to bring education closer to life, it is necessary to introduce flexibility in the organization of

school work and school hours. However, a scheme of the areas of school work and the allocation of time is given below. This scheme is notional and not prescriptive.

### Areas of School Work

#### *Classes I and II*

1. First language
2. Mathematics
3. Environmental studies (social studies and general science)
4. Work experience and the arts
5. Health education and games

#### *Classes III, IV and V*

1. First language
2. Mathematics
3. Environmental studies I (social studies)
4. Environmental studies II (general science)
5. Work experience and the arts
6. Health education and games

#### *Classes VI, VII and VIII*

1. The first language continues and a second is added (Hindi or English)
2. Mathematics (including algebra and geometry)
3. Social science (elements of history, geography, civics, economics)
4. Science (elements of the physical sciences and the life sciences)
5. The arts
6. Work experience
7. Physical education, health education and games

#### *Classes IX and X*

1. The first and second language continue and a third is added (English or any other Indian language).
2. Mathematics (including algebra and geometry)
3. Social sciences (history, geography, civics, economics, psychology)
4. Science (the physical sciences and the life sciences)
5. The arts
6. Work experience
7. Physical education, health education and games.

4.70 A word of explanation should be added here. The above scheme is illustrative of school work. But one may get an impression that there are too many subjects, if one counts each area of the curriculum mentioned as a sub-

ject. Actually, the arts, work experience, physical education, health education and games should not be considered as subjects.

#### Instruction Time in School

4.71 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 3 to 4 hours a 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.

#### Allocation of Time in Classes I-V

4.72 There should not be a rigid allocation of time in these classes because projects and group activities which cut across subject boundaries need flexible scheduling. However, a broad indication of the time allotment may be given here. This is indicated below in terms of the percentage of total time to be allotted to each area of school work.

<i>Classes</i>	First language	25
<i>I-II</i>	Mathematics	10
	Environmental studies (social studies and general science)	15
	Work experience and the arts	25
	Health education and games	25
		<hr/>
	Total	100
		<hr/>

<i>Classes</i>	First language	25
<i>III-V</i>	Mathematics	15
	Environmental studies I (social studies)	10
	Environmental studies II (general science)	10
	Work experience and the arts	20
	Health education and games	20
		<hr/>
	Total	100
		<hr/>

4.73 It should be noted that the first language will also be learned through environmental studies and games. Mathematics also will be learned through

work experience and the arts as well as through games. Hence work experience, arts and games have been given, 40% share of the time. Otherwise, a changeover from bookish education and rote learning will be difficult to accomplish.

#### Allocation of Time in Classes VI-X

4.74 Upper primary and lower secondary schools should work for 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 as given below. However, schools may make suitable modifications, wherever necessary, since what is indicated here is notional.

<i>Classes</i>	First language	8
<i>VI-VIII</i>	Second language	5
	Mathematics	7
	Sciences (life sciences and physical sciences)	7
	Social Sciences (history, geography, civics and economics)	6
	Arts	4
	Work experience	5
	Physical education, health education and games	6
		<hr/>
	Total	48

<i>Classes</i>	First language	6
<i>IX and X</i>	Second language	5
	Third language	2
	Mathematics	7
	Sciences (life sciences and physical sciences)	7
	Social sciences (history, geography, civics and economics, etc.)	7
	Arts	3
	Work experience	5
	Physical education, health education and games	6
		<hr/>
	Total	48

4.75 It may be noted that the proportion of time for languages is slightly less than the 25% shown earlier for the primary stage. The proportion re-

mains the same in the secondary stage, although the number of languages increases to three. But language will be learnt through the sciences and the social sciences, and as the medium of instruction is usually the first language, the proportion of time for the first language in the secondary classes goes down further. The effective time for language learning is much more because it will continue to be learnt through the sciences and the social sciences. The proportion of time for work experience, the arts and physical education is slightly less than a third. As against earlier years it goes down. This is because the sciences, the social sciences and mathematics take a larger share of the time—a little less than half, as a matter of fact.

### *Some Aspects of the Methodology of Education and the Teaching of Subjects*

5.1 Teacher-pupil activities and their organization are crucial in the educational process. The achievement of curricular objectives is contingent upon their proper visualization and effective manipulation. Keeping in view the nature and background of the learner and the local conditions and resources available, learning situations have to be prepared in a manner that the desired learning outcomes are obtained. These situations may be both within and outside the classroom.

5.2 The teacher is the guide, the helper, and, above all, the wise friend whom the children look to 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. He must show the child how to learn the subject, and how to devise his own methods of learning and organizing 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 attention becomes spontaneous.

5.3 Normally, a child has love and admiration for his teacher. Truly, he must be an example, but not set himself up as such. He 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 rebuked, or a derogatory remark be made to the effect that the child cannot understand. A teacher, if he takes pains, can always make himself understood.

5.4 There are certain basic requirements of the learning process which the teacher has to take into consideration to evolve the right approach and method. Proceeding from the concrete to the abstract, the simple to the complex, the known to the unknown, the whole to the parts and the easy to the difficult

are some of the basic tenets of teaching, too well known to be dilated upon. Some other factors of learning, however, may be discussed.

**5.5 Experience is the Key to Learning.** Experience in an actual situation gives first-hand knowledge of physical phenomena. Such experiences, if coherent, integrated and consistent, reinforce each other, while unconnected or compartmentalized learning experiences take more time and interfere with each other. Moreover, experiences utilizing many aspects of the child's psychological life in an integrated form have better chances of producing effective learning.

**5.6 Motivation is Basic to Learning.** The primary task in instruction is to manipulate the environment in such a way that children are stimulated to learn. It happens best when goals for learning are established in terms of the child'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. The pupil should be presented with problems and situations, where it can use what has been learnt, and get the satisfaction of success, and thereby ensure 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 the higher forms of learning.

**5.7 Readiness is the Foundation of Learning.** Readiness to learn depends upon the growth and developmental levels of the child. The physical, intellectual and emotional levels of the child's growth provide both the limiting conditions as also the foundations of learning. A child is capable of acquiring much more than the adults think it does, provided it is exposed to the right type of experiences. This requires a very judicious planning and a keen eye to identify the pupil's potentialities and inclinations in order to provide suitable experiences in line with his motivation and level of development.

**5.8 Readiness to learn acquires special significance in the context of the growing numbers in our schools.** Many children come from homes where parents are not educated (and this number is fairly large, especially in the rural areas). They 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 the educationally advanced homes. These first generation learners need to be exposed to special preparatory classes in order to profit from the regular schooling. These preparatory classes are necessary not only at the beginning of the primary classes but even later on.

**5.9** The above principles of learning are basic to the methods of 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 by a brief discussion of co-curricular and independent activities.

**5.10 The Primary Stage.** Language, the most commonly used medium of communication, is best acquired through actual use. Learning to speak satisfactorily forms the first step of language learning during the early years. Then comes

reading and writing. The readiness for reading, the introduction of a graded vocabulary content at successive stages and the use of a proper sequence of structures are important ingredients of a successful method of language teaching.

5.11 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 the environment. Readers for Classes I and II should have material which is interesting to the children; 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.

5.12 For the development of mathematical concepts the child should be helped through his experience with concrete situations in life. The 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 generalizations. 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.

5.13 Careful and well directed observation is the primary means of acquiring knowledge and cuts across several subjects. At the primary stage this has an added significance. Children should observe the vegetation and animal life around them. They should observe nature in all its 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 the 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 the children's 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; 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.

5.14 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 enjoys greater autonomy in organizing such experiences. The curriculum should indicate the kind of knowledge, understanding, interests, values and attitudes that should be developed in the children. It should also give suggestions about textual material, teaching aids, etc., to help achieve the objectives. The learning experiences



should be planned in terms of activities and programmes for the children. Helping children to prepare simple things from clay, taking them to the school garden and talking about flowers, organizing visits to nearby localities, measuring things available in the classroom or outside, discussing different seasons with reference to food, clothing and shelter, and organizing festivals and exposing children to situations where they may begin to appreciate the 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 of the values of self-sacrifice, patriotism, human brotherhood, etc. Inculcation of values, though emphasized in the statement of objectives, is generally paid lip service in the matter of providing learning experiences. It is necessary to emphasize that much of the learning in the primary stage should be through work experience, aesthetic activities and games. Attempts should be made to use the resources in the community, particularly the human resources, to enrich the experiences of the children and bring the community closer to the school. Evaluation of learning outcomes should be made frequently with a view to give the teacher an indication of the usefulness of the methods of teaching used as well as for feedback to the learner and his parents. Careful records of evaluation should be mentioned.

**5.15 The Middle Stage.** The study of the first language will aim at developing the abilities of listening, oral expression, reading comprehension and expression in writing. Instruction at this stage should help children develop their aesthetic ability, originality and creativity, and a feeling of pride in the nation. Supplementary reading material to read independently for knowledge and recreation should be introduced, and interest in reading developed. Recitation, drama, competitive writing, the wall newspaper, etc., should be encouraged. As a second language will also be there, it is necessary to make the learning of the second language interesting. Motivation is crucial, and for this it is necessary to reinforce every little step made by the child. Also, exhibition of pictorial materials and books should be arranged and speaking encouraged.

**5.16** In mathematics, while the discovery approach to teaching should still be used, the 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 the inductive to the deductive is to be effected as the student reaches higher classes. This method of analysis can be introduced very usefully in training students in the skill of independent thinking and problem-solving.

**5.17** A spiral approach may be used to extend the boundaries of the subject from stage to stage, and the applications of mathematics and science have to be integrated throughout the curriculum in a natural way. Correlation with the life around and with other subjects of study should prove to be very use-

ful and motivating to students for the study of the subject. Graphs and statistics find a natural place here.

5.18 For the teaching of science, there should be a gradual introduction of contrived situations. The student should handle scientific apparatus and perform experiments. Demonstrations by the teacher interspersed with questions and answers should help to establish the properties of substances or cause-effect relationships. Concrete experiences gained through demonstration or through experimentation by the pupils will help the understanding of theory.

5.19 The student will be introduced to elements of history, geography and civics at this stage. The effort should be made to teach these subjects from the composite social studies point of view, keeping man in the focus all along.

5.20 It should be profitable to organize the contents in terms of broad topics in Indian history, geography or civics and identify major ideas and understandings under a topic to give a proper focus. The values that can accrue from the study of the 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 a love for their country and an appreciation of 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 at cultural and social institutions should be encouraged through discussion of issues of national development.

5.21 It is necessary to emphasize that work experience, play and games should form an important means of organizing meaningful learning experiences cutting across language, mathematics, sciences and social sciences. There should be a continuous assessment of progress through frequent evaluation of learning outcomes, and the community and the school should come closer through the use of the resources of the community in learning and by the school's helping in the improvement of the life and environment of the community.

5.22 **The Lower Secondary Stage.** In the matter of the first language, 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 and in writing. He should be able to read with comprehension various forms of literary prose and to enjoy poetry. A more analytical approach and the use of exercises will be necessary. Those aspects of language analysis which are conducive to better comprehension and expression should be emphasized 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 as well as through the dramatic arts, essay competitions, recitation, the school journal, club debates, etc.

5.23 In the teaching of mathematics, there should be a shift of emphasis from the inductive to the deductive. The student should develop the analytic ap-

proach and apply it to solve problems or prove theorems. The use of independent thinking and a novel approach to solve problems or derivation of proof should be encouraged. A course on probability, graphs and statistics should permeate the whole curriculum on the 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.

5.24 The basic principles of chemistry, physics or biology should be taken up. The investigatory or experimental approach is suited to this stage of learning. However open-mindedness 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.

5.25 The approach to the teaching of history should be objective and comparative, stressing the social, economic and cultural aspects against the background of political developments. While teaching the 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 emphasized. Conflicts and tensions need to be understood in a proper historical setting. The methods of presentation should help develop an appreciation of the national and cultural heritage.

5.26 More independent work should be attempted by pupils through challenging assignments, group projects, debates, dramatization and history club activities. A variety of devices, charts, models, time-lines, dialogues, etc., can be used to make history teaching lively and to stimulate the imagination of pupils. The student should be introduced to the method of history through practical work.

5.27 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 the growing population to the natural resources and the need for conservation are also to be stressed. The student should be introduced to the method of geography through practical work.

5.28 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.

5.29 Economics should be introduced through the study of economic activities. As a matter of fact, all the social sciences should be learnt through carefully planned activities and observation. The students should begin to understand what are relevant data and how these are recorded and analysed. Through

social science, work experience and the school activities of organizing functions, week celebrations, debates, etc., learning should be made realistic.

5.30 Elements of psychology should be taught through observation of behaviour in groups as well as through self-observation. An understanding of adjustment problems and human relations should come from group discussions and individual counselling. Students should know how learning takes place and abilities are developed.

5.31 Work experience, physical education, aesthetic activities and games should contribute in large measure in developing the knowledge, skill and attitudes required for the mastery of the languages, the sciences, mathematics, the social sciences and the arts.

5.32. There should be frequent evaluation, and self-evaluation should be also introduced. Every evaluation should be discussed individually with each student. Results should be discussed periodically with parents.

5.33 The role of co-curricular activities in the development of attitudes, interests and values has been already emphasized. It is not possible to realize all the objectives of education without giving sufficient weightage to co-curricular activities in the total school programmes. A well-balanced individual is one who is physically sound, mentally alert, emotionally well adjusted and socially useful. Classroom instructional programmes alone cannot bring about an integrated growth. Co-curricular activities can be utilized for supplementing what goes on in the classroom in the area of abilities, skills and social and personal traits, and also to provide a good ground for nurturing desirable attitudes, interests and values and to help the child to actualize its potentialities.

5.34 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 to the children. In higher classes, the situations may become more structured and organized, 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 the choice of activities should be left to the pupils and the teacher should only be an adviser in the planning and execution of such activities. His control of the situation should be remote and not immediate.

5.35 Pupils' 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 requirements of the syllabus 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 indi-

vidual pupils.

5.36 Independent activities provide an excellent opportunity to students to acquire new knowledge as well. In projects such as those undertaken by talented 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 of fostering creativity.

## VI

### *Instructional Aids and Materials*

6.1 A teacher should explore 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.

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

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

6.3 The textbook, though very important among the instruction aids, is not adequate in itself to help the child to acquire the expected learnings in terms of knowledge, understandings, skills of learning, behavioural skills and attitudes. It needs to be supplemented by other aids like the workbook, test items, charts, films, etc., to further explain and concretize the various concepts. It may therefore be desirable to conceive of, and develop instructional kits consisting of a textbook and accompanying materials. The various component elements of an instructional kit, being closely interrelated and interdependent, will have to be planned and developed in terms of the over-all objectives of teaching a subject in a particular class.

6.4 The selection, improvisation and use of proper instructional aids play an important part in the realization of the instructional objectives in different subjects. A multi-media approach in the instructional process should lead to better learning. 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 should make instruction more effective by making a good use of the available aids and materials and also by improvising some with the help of locally available raw materials.

6.5 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 cases 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.

6.6 A point to which adequate attention is not always paid relates to the collection of such materials in the 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.

## VII

### *Evaluation and Feedback*

7.1 The main purpose of evaluation is to see how far the objectives set forth to be achieved through the curriculum have been realized. 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, should have the following characteristics:

- 7.1.1 It should give reliable and concrete evidence of the attainment of specific objectives.
- 7.1.2 It should gradually cover a number of objectives and the entire course of studies.
- 7.1.3 Evaluation should be done with a variety of tools and techniques:—written tests, practical and oral tests, observation, rating scales, etc.—to measure different objectives and content.
- 7.1.4 Evaluation should be at several points in time. It should not be a one-shot affair at the end of six months or one year, because its purpose is to give immediate feedback to pupils and teachers. The pupils should have a knowledge of the results of their learning as immediately after learning as possible. They should know clearly what they have learnt, how much they have learnt and how well they have learnt it. The teacher should know from evaluation, what his instruction has done, where his instruction has failed and where his instruction needs change, so that all the pupils are able to master the subject he teaches, or develop the qualities intended to be developed by the learning experiences. Hence, evaluation should be done by the teacher himself.

7.2 It is important that students do not develop wrong attitudes to evaluation, but take it in the right spirit as a means of improving their own achievement. Insistence on passing in all the subjects of a course at one time, and the consequent fear of failure, drives many a student out of gear with studies and im-



pedes further growth. Such a situation has to be changed. There should be flexibility. The mode of evaluation has to be such that students are discouraged from memorization and become competent to apply their knowledge in handling new situations and problems. Children will not work for higher types of learning like critical thinking, creativity and evaluative judgment, unless such learning is attempted to be developed through suitable experiences and is followed by proper evaluation. Where the only learning experiences provided in school are of the drill type and where the mode of evaluation encourages cramming, all that we have discussed so far about education becomes useless.

7.3 At the primary stage, children are young and tender. No rigid system of evaluation should be imposed on them at this stage. Evaluation should be integrated with the process of learning, and a system of continuous recording of the progress and development of each child, on the basis of observation and oral tests, should be prepared. 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, and, normally, all the children should be promoted. However, special attention should be given to those children who do not show adequate progress, and particularly to the children from backward sections of the society.

7.4 Continuous evaluation of the development of the pupils in all aspects should be a regular procedure. From the middle stage onwards, the written examination should have a place in evaluating the achievement of students in subject areas. But there should be a variety of ways of testing and not just essay tests. 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 examinations may also be held, if considered necessary, but these should not have an unduly greater weightage than the other assessments made during the year. The emphasis should not be on formal tests for pass or fail in the aggregate; it should be on the assessment of pupil growth for the guidance of all concerned. There should not be any pass or fail in any examination, as a matter of fact. Letter grading on a five-point scale (A, B, C, D, E) may be conveniently used. What is important is to utilize this evaluation for the furtherance of learning. This can be done by giving back the corrected answer-books to the students and discussing with them the mistakes committed by them and showing them how they could do better. If any student wishes to improve his grade in any one evaluation, he should be given another chance by way of giving him another examination in that subject only.

7.5 The school's cumulative assessment in each subject/unit should be placed on record and given to each student. A record of such assessment should cover both scholastic and non-scholastic areas, and be without any aggregate. Thus, there should be no pass or fail in the final school-leaving certificate. This certificate should give only the letter grades (A, B, C, D, E) of each student in the school. Gradually, as the system of internal assessment takes root and a system of checking biases which lower standards is evolved, the external public exa-

mination at the end of Class X will become redundant and should be abolished. It would be necessary for each Board|State to evolve a phased programme of accomplishing this.

7.6 School complexes may be established throughout a state. The teachers of the school in any one complex may form a committee which may, from time to time, call for answer-scripts and question papers from the schools in their jurisdiction and re-examine samples to check biases and then discuss the matter openly with the teachers concerned. District education officers and inspectors and senior teachers in a district may set up a committee to do such sample checking and discuss results with the school complexes concerned. At the State level, there may be similar committees. This will be one way of ensuring that evaluation is properly done and standards maintained. Every school should hold community meetings from time to time not only to involve the community in the school programme, but also to let the community know how evaluation is done and used for the improvement of pupil growth and learning as well as for the improvement of instruction by the teachers.

## VIII

### *Implications for Implementation*

8.1 The implications for the implementation of 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
  - Coordination
  - Clearing-house activities
- C. Implications for schools
  - The school atmosphere
  - Provision of facilities
- D. Involvement of the community

#### **A. Machinery for Implementation**

8.2 The infrastructure for curriculum renewal already exists both at the national and the State levels. It may also be found in good institutions. However, it is desirable to define its scope and functions more explicitly.

#### **At the National Level**

8.3.1 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 NCERT's 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 and also to promote and support various research and development activities related to the

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 centres established.

#### At the State Level

8.3.2 At the State level, a number of agencies are directly or indirectly concerned with the curriculum. The State Institutes of Education, State Institutes of Science Education, the Boards of Secondary Education, the Textbook Bureaus, Guidance Bureaus and similar other specialized institutions are all involved in curriculum work in some form or the other. It is very necessary to coordinate their work and define their specific roles in so far as curriculum renewal is concerned. Some States have already set up State Councils of Educational Research and Training. 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

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

#### Research and Development

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

- (i) Development of detailed syllabi for a common core curriculum of a minimum number of units followed by the development of materials, such as textbooks, teachers' guides, workbooks, teaching aids and kits, etc., based on actual field try-out. This will have to be done by NCERT in collaboration with State Boards of Secondary Education, SCERTs, SIEs, etc.
- (ii) Instructional techniques and methods to ensure maximum effectiveness will have to be developed.
- (iii) Evaluative studies to ascertain how far the objectives of general education as a whole and of the various components of the process are being realized have to be periodically carried out by NCERT and State-level agencies.
- (iv) Studies concerning motivation, learning, development and behaviour characteristics of children will have to be encouraged.
- (v) Studies concerning school climate and the roles of different func-

tionaries in the school to ensure effective learning conditions will have to be made at the State level by the State-level agencies.

- (vi) Studies on the socio-psychological implications of the proposed curricular changes with specific reference to determining ways and means to ensure the effective participation of the community will have to be done by teachers colleges, universities, etc.
- (vii) Studies will have to be conducted to find out the efficacy of the measures adopted to change the examination system.

8.6 The National Council of Educational Research and Training should provide the necessary leadership in this field to initiate, promote and undertake scientific studies in the various areas stated above. It should not only coordinate research work going on in the States, but should also offer expert advice and guidance for specific studies. It should identify specific institutions capable of undertaking scientific studies on the 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.

8.7 Every State Government should set up a strong Curriculum Cell in the State Institute of Education which should be responsible for coordinating, promoting and undertaking research and developmental studies at the State level. Selected teachers colleges and other colleges and institutions could be fruitfully involved in this activity. The Boards of Secondary Education, SIEs, SCERTs and some selected colleges and universities should be involved in developing the syllabi, textbooks, workbooks, teachers' guides, instructional aids, kits, etc., in collaboration with NCERT.

### Training and Extension

8.8 The new emphasis given in the objectives and purposes of general education makes the teacher's role crucial in their realization. The teacher 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 the in-service and the pre-service education of teachers.

### In-service Teacher Preparation

8.9 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 orient them to the new content and methods as also materials in different curricular areas. They may also be made acquainted with the various strategies which they could try for implementing the maximum changes at the minimum cost by exploiting the available community resources. Areas like science and work-experience will need special planning and effort. It will be necessary to train teachers for the task of continuous internal assessment. Question banks will have to be developed at the Board level for

all classes of the school. Teachers will have to be helped in learning the letter grading in place of marks in examinations. Suitable checks will have to be developed for controlling the biases of an internal evaluation system. This will require setting up school complexes and training all the persons in such complexes to supervise the work of evaluation. The NCERT and the State agencies should chalk out a time bound programme.

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

- (i) Preparation of courses and materials for the in-service education of teachers in different curricular areas. The materials may be in the form of resource materials, teachers' handbooks, audio-visual aids, etc.,
- (ii) Training of key personnel drawn from the States.
- (iii) Helping the States in the development and implementation of their extension programmes of direct relevance to the proposed curricular changes.
- (iv) Creating the necessary climate for change in the States by organizing teachers' meets, seminars, conferences, etc. Most of this should be done in collaboration with the State agencies.

8.11 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 the orientation of teachers in science and mathematics.

8.12 Every State should prepare a three-tier plan of in-service teacher education. The first tier will consist of teacher educators and selected college and university teachers who should be oriented at the Regional College of Education. The second tier will be of the head teachers and secondary school teachers, organized area-wise within a State, who will be trained by the key persons trained in the first tier. The third tier will consist of primary school teachers and should be organised district-wise. The training will have to be given by both the first and second tier trainers. Self-learning materials should be produced on a large scale. A national and State-level machinery will have to be set up for this.

#### **Pre-service Teacher Preparation**

8.13 This is necessary 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 school curriculum, such as relating the school to work, developing proper attitudes and values, the integrated approach to teaching, improvisation of aids, enlisting community help, exploitation of available resources to the best advantage, continuous evaluation etc.

Preparation of teacher educators to face this new challenge.

8.14 The NCERT, as also the Regional Colleges of Education under it, will have to play a key role in this area. They will 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 the 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 off-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 cleavage between the school and work has to be bridged.

8.15 The State Departments of Education and the universities will also have to take immediate action to revise the curricula for teachers colleges on the above lines in collaboration with the NCERT, wherever needed.

#### Coordination

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

8.17 The NCERT will have to coordinate the effort of its constituent units with that of the State-level agencies. This may be done through periodical conferences and meetings, developing materials and aids for adaptation 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 utilized for this purpose.

8.18 At the State level itself, there is a need for coordination. There are various agencies like the Directorates of Education, Boards of Secondary Education, State Institutes of Education and Textbook Bureaus dealing with curricula for different sub-stages and with 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 coordination to one of them. This will become easier if an agency on the lines of the NCERT is set up in each State, as has already been done in a few States.

#### Clearing-house Functions

8.19 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 will have 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 within the States, on the other. Ultimately all worthwhile innovations and research findings acquire meaning only when these are transmitted to the user.

#### C. Implications for Schools

8.20 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 the school.

##### The School Atmosphere

8.21 Operationally, a curriculum is not what is stated on paper, but what actually happens in a school. Ideally, each school should have the freedom to develop its own curriculum within the framework of the 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 the pupils, wastage and stagnation will continue to remain.

8.22 The headmaster is the key person in this business of creating an attractive school atmosphere. There are two components of this atmosphere, viz., physical and psychological. The school building may be simple, yet it can be made attractive. If the headmaster is able to enlist the cooperation of the teachers, students and parents, it is not difficult to provide the minimum essential facilities without incurring huge 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 considerable changes.



8.23 The social and cultural atmosphere of the school is important. It should be attractive to the child and the parents. It should lead to the development of a sense of belonging among all concerned. There should be proper rapport among the head, the teachers, the pupils and the guardians. Good work should be appreciated. Decision-making should be democratic. There should be flexibility in the time-table. Each child should be recognized as an individual. The staff should work as a team and should not be distant from the students. 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 decisions collectively on matters of common interest and in keeping with the over-all 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 atmosphere for learning.

#### Provision of Facilities

8.24 The next important requirement is the provision of the 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.

8.25 The provision of guidance facilities in school is also very necessary for the satisfactory development of the pupils. Students have to be helped in the selection of courses and in making a vocational choice at the end of the period of general education. They are to be provided with information about the 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. The educational needs of children coming from the weaker sections of the society have to be located and suitable provisions made to satisfy them. Diagnostic testing and remedial instruction has to be provided for slow learners. 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 if adequate guidance services are pro-

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vided and school counsellors for individual or groups of schools are available, and teachers are oriented to guidance activities, and, with the cooperation of parents, cumulative records of the individual pupil's growth and development are maintained.

8.26 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 service is very necessary for the harmonious development of the pupils. In their training programmes teachers should be acquainted with the 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 the school health officer for corrective measures. Teachers should be trained in rendering first aid. This knowledge comes handy in times of emergency. Teachers should maintain records of height, weight, etc., and this record in the case of 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, the provision of medical services for schools is essential for a satisfactory implementation of a school health programme.

8.27 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 a wholesome yet inexpensive midday meal.

#### D. The Involvement of the Community

8.28 The community should realize that the school is to serve their needs and that the education of their children is necessary for the prosperity of the community. The existing distance between the school and the educational administrators as well as the community has to be reduced. For this purpose the attitude of the teacher has to change. A sincere teacher can surely make the school a centre of community activities. The community, in turn, can provide facilities in men and material through its own effort for nurturing the school.

8.29 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 and the arts. 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 problems being faced at the moment, particularly at the primary level, will automatically vanish. It should be possible to utilize the artisan, the carpenter, the blacksmith, the experienced farmer, the artist, the musician and such other persons in the

community; they could be brought to participate in the work experience and other curricular areas in the school. One need not always have a trained teacher. Students and teachers on their part should participate in community life, whether it is cleanliness, health, sanitation, literacy, beautification, road construction, irrigation, child care, or work in the farm, the factory and the hospital.

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