

**RECOMMENDATION No. 35**  
**TO THE MINISTRIES OF EDUCATION**  
**concerning**  
**TEACHING OF NATURAL SCIENCE IN SECONDARY SCHOOLS**  
(1952)

The International Conference on Public Education,

Convened at Geneva by the United Nations Educational, Scientific and Cultural Organization and the International Bureau of Education, and being assembled on the seventh of July, nineteen hundred and fifty-two for its fifteenth session, adopts on the sixteenth of July, nineteen hundred and fifty-two, the following recommendation:

The Conference,

Considering that education is incomplete without a study of natural science;

Considering that modern life requires everyone to have a stock of basic scientific knowledge, so that he may the better understand his natural environment and apply scientific discoveries to improving the community's standard of living;

Considering the value that a study of natural science has for the development of moral qualities;

Considering that such a study also brings to light the achievements of international cooperation in the field of scientific research, and thus helps to improve relationships among men;

Drawing attention to the recommendation on the introduction to natural science in primary schools, adopted by the XIIIth International Conference on Public Education in 1949;

Submits to the Ministries of Education of the various countries the following recommendation:

1) It is desirable that in secondary schools the teaching of natural science should be as extensive as possible, and in any case should provide a common core of fundamental knowledge for all pupils between 11 and 15 years of age and a wider and deeper study for certain groups of older pupils;

2) The teaching of natural science in secondary schools should provide pupils with basic knowledge about the world and man, give them experience in scientific method, and develop their general culture and sensitiveness. Its aims are as follows:

*a)* teaching children (the adults, parents and citizens of tomorrow) about the structure, functioning, and care of the bodies of human beings and other living creatures; the nature of the earth on which they live; and the interdependence of living creatures and their dependence on the soil;

*b)* aiding children's intellectual growth through activity methods designed to cultivate and, if need be, awaken, their capacity to observe, describe, and evaluate (discovering, investigating, comparing, classifying); fostering a love of truth and intellectual honesty, pleasure in work well done, and a liking for order; developing manual skill; developing love for nature and natural beauty, and respect for living creatures; inculcating the duty to safeguard human and natural resources;

3) On account of the quite special character of natural science teaching, syllabuses should:

*a)* pay greater regard than those of other subjects to regional needs and potentialities, while giving priority to knowledge of man and the conditions of his existence;

*b)* give an important place to actual problems concerning food, public and private health, agriculture and animal husbandry;

*c)* be suggestive rather than prescriptive, in order that teachers may be free to organize their work in the light of local resources and the individual abilities and interests of their pupils;

4) Sound natural science teaching calls for the greatest possible activity from the pupils, and requires them to observe the facts and study their inter-relationships, to experiment, and to discuss the results, so that they may pass from concrete cases to abstract laws;

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5) For such teaching pupils should be provided with adequate and varied material aids:

- a)* collections and the means to maintain and enrich them;
- b)* funds for securing living or fresh specimens (aquaria, vivaria, terraria);
- c)* laboratory materials, instruments for dissection and observation, projectors for still and moving pictures, cameras, works of reference;
- d)* centres from which schools may obtain all necessary equipment and materials;
- e)* national or regional centres for making, distributing and exchanging films in collaboration with the teachers concerned;
- f)* facilities of access to State and private museums, exhibitions, zoological and botanical gardens, woods, ponds, quarries; mountains, and beaches. The construction and use of teaching aids by the pupils themselves is a practice to be highly recommended;

6) The use of audio-visual aids is to be recommended provided they form an integral part of the teaching;

7) The teaching of natural science should interest pupils in safeguarding fauna and flora and natural beauty spots, and the creation of national parks to prevent encroachment by agriculture and housing;

8) It is desirable that children should be encouraged to express their thoughts in correct and precise language, and in certain circumstances by drawing and modelling;

9) School work should be supplemented by the organization of leisure activities, particularly in the form of young naturalists' clubs or societies, enabling teachers and pupils by means of conversations individual work, excursions, etc., to get to know each other better widen their mental horizon, and effectively interest themselves in problems and experiments extending beyond the classroom;

10) The teaching of natural science requires teachers who have the special qualities of the naturalist and it is therefore desirable that even the lowest secondary classes should be taken by teachers well qualified from the point of view both of their knowledge and of their ability to arouse and stimulate the interest of their pupils;

11) It is desirable that educational supervisors be appointed, that is to say, teachers of recognised ability, with the responsibility of guiding a certain number of their less experienced colleagues;

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12) Apart from the constant personal effort to increase their knowledge which teachers may be expected to make, it is necessary to offer them inservice facilities for verifying and refreshing their knowledge in the form of courses and conferences;

13) The need should always be kept in mind of coordinating natural science with other subjects such as geography, social studies, history and philosophy, and even literature, through the reading of authors whose best work has been devoted to natural phenomena and problems.