

# 4. Mathematical Teaching in Middle Schools.

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matters, should be presented inasmuch as these practical matters will provide motives for the development of mathematical ideas on the part of the children and, by encouraging voluntary learning activities, lead them to achieving the creation of personal experiences conforming to their respective abilities.

2. By means of analysis and synthesis of these personal experiences on the part of the pupils, general mathematical ideas should be developed systematically.

3. What has thus been acquired by the children of mathematical thought should be consolidated by repeated practices.

4. In addition, by making these acquirements applied to the settlement and disposal of actual questions facing the children, they should be developed into active faculties to meet practical life, which would constitute important factors in laying the foundation for the children to enter upon useful activities in the years to come both as an individual and as a citizen.

#### 4. MATHEMATICAL TEACHING IN MIDDLE SCHOOLS.

With the Outlined Program remaining intact for nearly 20 years, the initiative was taken in 1917 by those directly connected with mathematical education in the country in launching active movements for reforming mathematical teaching. The first definite indication of the reform move was seen towards the end of 1918 when a Conference of All Japan Mathematical Teachers was convened in Tokyo, which was followed shortly afterwards by the inauguration of the first annual general session of the Mathematical Association of Japan for Secondary Education.

The educational system for middle schools in Japan was revised in 1931 when the course of the middle school was divided into two categories, the First Kind of the Curriculum aiming at certain instruction of business subject and the Second Kind of the Curriculum being arranged mainly for the benefit of those who wish to prepare themselves for admission to higher-grade schools. The choice between the two categories is permitted to be made in accordance with the pupils' abilities, dispositions and wishes as well as local circumstances.

Main features of the new program are, among others, the division of the curriculum into the regular and the complementary studies, the adoption of unionist principle in construction, the importance attached to practical application in arranging the contents of each curriculum, and the preference given to intuitionism in designing teaching methods. Various pending issues have thus been settled on this field of the secondary education and a new phase has been developed in the mathematical teaching in the country.

The revised outlined program provides for the number of lesson hours per week for mathematical teaching in middle schools.

Summing up the salient features of the present program of mathematical instruction and the effects it has produced, we may take note of the following points.

1. The appreciation of synthesis.

It has been in consideration of this principle that, instead of putting down the names of Arithmetic, Algebra, Geometry, Trigonometry and so on, only concrete items of these subjects are mentioned in this program. It is stated in the precautionary notes attached to the new program that the idea of function should be made the centre of synthetic practices.

2. Only major items have been shown in the program.

Arrangements in this connection have been calculated to remove pressure likely to be brought by any over-specified curriculum upon actual instruction as well as to prevent teaching formula from being standardized. With details of the teaching program left for compilation to the discretion of instructors and editors of text-books, the new outlined program, when proper use is made of it, is believed to accomplish much in the development of mathematical teaching in the country.

3. Practicability has been stressed.

Among other things indicative of the attention called to the selection of teaching materials such as would be most pertinent to actual requirements, the following three points may be pointed out in the new teaching plan.

(a) Instruction in algebra is made to center around equations and most of those difficult problems relating to mere formalities have been deleted.

(b) The introduction of numerical trigonometry has been expedied.

(c) Special regard has been paid to the fostering of functional ideas in children resulting in considerable increase in graphic materials.

4. Attention has been brought to the degrees of the development of pupils' capacities. A striking indication hereof will be seen in the insertion of Geometrical Figures in the geometrical stuff in the new program, which is chiefly to be dealt with through intuitional practices.

5. MATHEMATICAL TEACHING IN GIRL'S HIGH SCHOOLS.

In 1920 the week hours for mathematical teaching in girls' high schools were revised. With the selection of teaching materials