Place of Mathematics in Curriculum

The Importance of Mathematics

Mathematics is the mother of all science. The world cannot move without Mathematics. The study of mathematics equips students with knowledge, skills, and habits of mind that are essential for successful and rewarding participation in such a society. Mathematical structures, operations, processes, and language provide students with a framework and tools for reasoning, justifying conclusions, and expressing ideas clearly. Through mathematical activities that are practical and relevant to their lives, students develop mathematical understanding, problem-solving skills, and related technological skills that they can apply in their daily lives and, eventually, in the workplace.

In school **Kothari Commission** has explained about placing mathematics as a compulsory subject upto higher secondary or tenth standard and has said, "Mathematics should be made a compulsory subject for the students of 1st to Xth standard, as a part of general education."

The mathematics curriculum

Mathematics encompasses a body of knowledge, skills and procedures that can be used in a rich variety of ways: to describe, illustrate and interpret; to predict; and to explain patterns and relationships in Number, Algebra, Shape and space, Measures and Data. Mathematics helps to convey and clarify meaning. Its language provides a powerful and concise means by which information may be organised, manipulated, and communicated.

This curriculum seeks to provide the child with a mathematical education that is developmentally appropriate as well as socially relevant. The mathematics programme in each school should be sufficiently flexible to accommodate children of differing levels of ability and should reflect their needs. These will include the need for interesting and meaningful mathematical experiences, the need to apply mathematics in other areas of learning, the need to continue studying mathematics at post-primary level,

Aims and Objectives of Mathematics Curriculum

The narrower aim of teaching Mathematics at school is to develop useful capabilities, particularly those relating to numeracy- numbers, number operations, measurements, decimal and percentage.

The broader aim is to develop the child to think and reason mathematically, to pursue assumptions to their logical conclusions and to handle abstractions. School Mathematics curriculum should help the children learn to enjoy Mathematics.

Development of Mathematics Curriculum as per NCF 2005

NCF-2005 reiterate the values enshrined in our constitution, reduction of curricular burden on children, ensuing quality education for all and systematic changes as makers of curricular reform. It recognizes the primacy of children's experiences, their voices and their active involvement in the process of learning. Learning at school should be such that children can construct knowledge from experiences and environment.

For Mathematics Vision of school Mathematics has been laid in NCF-2005 as follows:
Children learn to enjoy Mathematics rather than fear it.
Children learn important Mathematics: Mathematics is more than formulas and mechanical procedures.

Principles of Formulating Mathematics Curriculum
While Understanding the Discipline of Mathematics curriculum we need to consider those topics Mathematics or themes, which would help children to succeed in their everyday life. The topics like interest, percentage, ratio, data interpretation, graphs etc are some of those topics. Secondly child's needs, interests and capabilities should be considered as the base for curriculum construction. As the whole process of education is now going to be child-centred that means a curriculum must be child-centric.

Subject-Centred Approach
This is also known as 'Traditional Curriculum' and we have moved away from this after the implementation of NCF-2005. This approach to curriculum lays more emphasis on content in comparison to learners and teaching process. Here, teachers' role is very crucial who are expected to transact the curriculum with a view to help students to learn different subjects.

Behaviourist Approach
In this approach, the development of curriculum starts with a plan, called blueprint. Blue print consists of goals and objectives of learning of the particular subject. The topics, contents and activities are to be planned on the basis of these pre-determined objectives. The duty of the teacher is to provide for the activities specified for realising these objectives. The student assessment, basically in the form of written knowledge and tests, needs to be conducted to know how far these objectives have been achieved.

Constructivist Approach
It is based on the premise that whenever a child encounters a new experience, he/she can either easily connect it with the existing knowledge or can make some changes in the existing knowledge to accommodate the new experience. **Piaget,** a famous constructivist psychologist said that Mathematics is a subject, which may be very difficult to teach, instead, it has to be 'constructed' by the child.

Learner-Centred Curriculum
In this approach, the needs and interest of learners are paramount. Those facts, concepts, theorems, processes, skills, etc, which are very essential for the child, should have a place in the curriculum. Here the role of student will be that of an active participant in the learning process, and therefore, it necessitates that the teacher should know well each child.

Activity-Centred Curriculum
This is based on the premise that child loves to play and activity will help to create motivation. When curricular material is presented in terms of activity, it is known as activity centred curriculum. Learning of the prescribed material included in the curriculum takes place through appropriate activities.