

CHAPTER 3 ORGANIZING THE MATHEMATICS CURRICULUM

3.1 Dimensions

In the primary school level, the mathematics syllabus is organized in five dimensions, namely Number, Measures, Shape and Space, Algebra, and Data Handling. Less emphasis will be put on the Number and Measures Dimensions in the secondary school level. It is not easy to identify certain learning areas into one single dimension in key stages 3 and 4. For instance, the Trigonometry can be considered as a measure for triangles in junior forms but will be emphasized more in a functional perspective in senior forms. Hence, it is more reasonable to merge and **integrate 5 dimensions into 3**, namely **Number and Algebra, Measures, Shape and Space** and **Data Handling**.

The learning contents in each dimension are further subdivided into modules and units. The subdivision, on the one hand, reflects, to a certain extent, the relations of learning areas of the similar nature. On the other hand, it is hoped that the arrangement can facilitate students to relate learning areas of the similar nature in different years' of study. An overview of learning dimensions and learning modules can be referred to Annex II. Further details of units for each module and the corresponding time ratio are listed in Section 4.2.

It should be noted that the classification of dimensions, modules and units does not mean that they are discrete. In fact, concepts of mathematics are connected within a framework that is 'multi-dimensional'. Concepts in one dimension are very often linked to concepts in other dimensions. For example, the Number and Algebra Dimension provides tools that may be needed in all other areas of mathematics. It is important for students to appreciate the interrelations of various disciplines of mathematical knowledge.

3.2 Structure

As the curriculum is designed for the whole population of secondary school students, which covers a wide range of abilities, interests and needs. To assist teachers to tailor the mathematics curriculum to meet the needs of their individual groups of students, it is useful to identify the '**Foundation Part**' of the **Whole Syllabus**. The '**Foundation Part**' of the Syllabus represents the topics that ALL students should strive to master. The Foundation Part is identified under the principles that:

1. it is the essential part of the Syllabus stressing the basic concepts, knowledge, properties and simple applications in real life situations;
2. it contains different components that constitute a coherent curriculum.

Teachers can judge for themselves the suitability and relevance of topics outside the Foundation Part of the Whole Syllabus for their own students. Teachers may also include some **Enrichment Topics** at their discretion. These optional enrichment topics, targeted at

the most able students, could extend students' exposure in mathematics. The objectives for the Non-Foundation Part of the Syllabus and some enrichment topics are respectively underlined and denoted with ** in Sections 4.3 and 4.4 for teachers' reference.

3.3 Time Allocation

The suggested time allocated for teaching the subject for years one to three is **5** periods per week and that for years four and five is **6** periods per week. It is assumed that there are 40 minutes in each period and 40 periods in each week. In Secondary One to Three and Secondary Four to Five, a total of **480** and **280** periods should be available for the total three and two years respectively. To aid teachers in judging how far to take a given topic, a time ratio is given.

It can be seen that there are a number of periods left in each key stage. These spare periods can be used for consolidation activities or enrichment activities etc. to suit the teaching approaches and the standard of students in the individual schools.

Allocation of time ratio in respective KS3 and KS4 is listed as follows:

Key Stage	Number and Algebra Dimension Time ratio (%*)	Measures, Shape and Space Dimension Time ratio(%*)	Data Handling Dimension Time ratio (%*)	Further Applications Module Time ratio (%*)	Sub-total
KS3 (S1-S3)	162 (39)	192 (46)	60 (15)		414
KS4 (S4-S5)	113 (42)	88 (33)	35 (13)	30 (12)	266
Total	275 (40)	280 (41)	95 (14)	30 (5)	680

* The percentage is calculated with the number of periods divided by the sub-total of periods in each key stage.

3.4 School-based Mathematics Curriculum

The purpose of subdividing the learning units and modules only up to each key stage is to provide flexibility for schools to design their school-based mathematics curriculum to suit individual school's need. In designing school-based mathematics curriculum, schools are encouraged to

- decide the aims and targets for the whole school mathematics curriculum and each key stage;
- select the depth of treatment of the learning units which lie outside the Foundation Part of the Syllabus;

- arrange the learning units in a logical sequence for each year level;
- choose an appropriate textbook;
- decide the learning activities such as statistics project work, analyzing information collected from the Internet, group work, etc. to be carried out in the school year;
- select extra-curricular activities such as mathematics competition, mathematics bulletin, mathematics reading scheme etc, for students in each individual year level or for the whole school; and
- decide the methods of assessment and recording that provide feedback for teaching and learning.

In selecting learning units for each year level, schools should follow the following principles:

- i) the cognitive development of students;
- ii) the mathematical abilities of students;
- iii) the learning objectives for each learning unit;
- iv) the inter-relation of learning units; (refer Annex III)
- v) the inter-relation of mathematical learning in different year levels; and
- vi) the total number of periods allocated for mathematics in each school year.

It should be noted that there are many combinations of learning units for each year level. Schools can arrange the learning sequence with the orientation to focus on one dimension first and then the other dimensions in later forms. Schools can also arrange the learning sequence for students to learn each dimension spirally in each year. Schools may even reserve more periods in junior forms to revise and consolidate students' learning in primary schools and focus only on the Foundation Part of the Syllabus over the five years to cater for low achievers.