

Mathematics Education

➤ *Position*

Mathematics is a mode of thinking, a powerful means of communication, a tool for studying other disciplines and an intellectual endeavour. Mathematics education aims to develop students' ability to conceptualise, inquire, reason, communicate, formulate and solve problems mathematically; and their capability of appreciating the aesthetic nature and cultural aspect of mathematics.

➤ *Direction*

- Reduce mechanical drilling in mathematics learning.
- Focus on foundation knowledge and skills, capabilities to learn how to learn, think logically and creatively, develop and use knowledge, analyse and solve problems, access and process information, make sound judgement and communicate with others effectively.
- Develop students' confidence and positive attitudes towards mathematics learning.

➤ *We hope that from now to 2005-06*

<i>Our students</i>	<i>Our teachers</i>
Primary 1 - Primary 3	
<ul style="list-style-type: none">• understand basic mathematical concepts and computational skills• apply basic mathematical knowledge in daily life• show interest in learning mathematics	<ul style="list-style-type: none">• avoid meaningless drilling• use diversified learning activities (including role play and manipulation of real objects) to arouse students' interest in learning mathematics• use diversified assessments (including classroom observation and questioning) for improving learning and teaching

Primary 4 - Primary 6	
<ul style="list-style-type: none"> • understand mathematical concepts and skills • apply mathematical knowledge in daily life • maintain interest in learning mathematics 	<ul style="list-style-type: none"> • avoid meaningless drilling • encourage more teacher/ student interaction in class to enhance students' thinking and communication skills • use diversified learning activities and tools (including using calculators and information technology) to arouse students' interest in learning mathematics and foster high order thinking skills • use diversified assessments (including open-ended questions and projects) for improving learning and teaching • adapt the mathematics curriculum to cater for learner differences and use curriculum space created flexibly for consolidation and enrichment
Secondary 1 - Secondary 3	
<ul style="list-style-type: none"> • understand more abstract mathematical concepts and related skills • understand symbolic treatment of mathematics • apply mathematical knowledge in real-life situations • maintain interest in learning mathematics • participate in mathematics-related activities 	<ul style="list-style-type: none"> • avoid meaningless drilling • encourage more teacher/ student interaction in class to enhance students' thinking and communication skills • use diversified learning activities and tools (including project learning and using information technology) to arouse students' interest in learning mathematics and to foster high order thinking skills

	<ul style="list-style-type: none"> • use diversified assessments (including open-ended questions and projects) for improving learning and teaching • adapt the mathematics curriculum to cater for learner differences and use curriculum space created flexibly for consolidation and enrichment
Secondary 4 and above	
<ul style="list-style-type: none"> • understand more complex and abstract mathematical concepts and related skills • apply mathematical knowledge in more complex real-life situations • handle mathematical problems in a more abstract context • maintain interest in learning mathematics • participate in mathematics-related activities outside school to broaden perspectives 	<ul style="list-style-type: none"> • avoid meaningless drilling • encourage more teacher/ student interaction in class to enhance students' thinking and communication skills • use diversified learning activities and tools (including project learning and using information technology) to arouse students' interest in learning mathematics and to foster high order thinking skills • use diversified assessments (including open-ended questions, projects and oral presentation) for improving learning and teaching • adapt the mathematics curriculum to cater for learner differences and use curriculum space created flexibly for consolidation and enrichment

➤ *Major Issues of Concern*

- Overlapping of various mathematics curricula and inadequate curriculum space for fostering the thinking abilities of students - The Primary Mathematics, Secondary Mathematics and Additional Mathematics Curricula have been revised to address the issue. The sixth form mathematics curriculum will be re-structured pending introduction of the new senior secondary academic system.
- Inadequate handling of learner differences in mathematics teaching - Flexibility is allowed in both the revised Primary and Secondary Mathematics Curricula.
- Insufficient attention to the development of high order thinking skills - The fostering of high order thinking skills is emphasised in the revised mathematics curricula.
- Examination-driven teaching approach - Diversified learning activities are stressed in classroom teaching in the revised mathematics curricula.
- Over-emphasis on paper-and-pencil assessment tools - Diversified assessment tools including classroom observation, questioning and projects are encouraged.

➤ *Exemplars of the Mathematics Education Key Learning Area are available in the folder of Exemplars of Curriculum Development in Schools and/or the curriculum bank (<http://cd.ed.gov.hk>) include:*

- Know the Community (Key Stage 2)

This exemplar is a cross-curricular project. Students working in groups are to collect authentic data from the community to which they belong and hence acquire knowledge of "directions" from their environment. Through the process of analysis and organisation of the data, they have a better understanding of their community. This exemplar helps to foster students' collaboration, communication, critical thinking, problem solving, creativity and numeracy skills.

- Taxi Fare (Key Stage 4)

This exemplar aims to help students recognise the difference between the meaning of "rate" in mathematics and in daily-life applications. In the former, "rate" indicates the quotient between two different quantities and the relationship between these two quantities is linear. In the latter, the relationship is not necessarily linear. Instead, quantities may have a step-like relationship. Examples include postage, taxi fares, etc. This exemplar helps to foster students' critical thinking and problem-solving skills.

The Mathematics Education KLA Curriculum Guide will be published in 2002 and the Revised Additional Mathematics Curriculum Guide in February 2002.