

LEARNING and TEACHING POINTS
for
Chapter 2
Mathematics in the Primary Curriculum

In shaping, monitoring and evaluating their medium-term planning, teachers should ensure that sufficient prominence is given to each of the five reasons for teaching mathematics:

1. its importance in everyday life and society;
2. its importance in other curriculum areas;
3. its importance in relation to the learner's intellectual development;
4. its importance in developing the child's enjoyment of learning; and
5. its distinctive place in human knowledge and culture.

Learning experiences for children in mathematics should include a focus on the child's intellectual development, by providing opportunities to foster: (a) problem-solving strategies; (b) deductive reasoning, which includes reasoning logically and systematically; (c) creative thinking, which is characterized by divergent and imaginative thinking; (d) inductive reasoning that leads to the articulation of patterns and generalizations; and (e) communication of mathematical ideas orally and in writing, using both formal and informal language, and in diagrams and symbols.

Learning experiences for children that reflect the contribution of mathematics to everyday life and society could include, for example: (a) realistic and relevant financial and budgeting problems; (b) meeting people from various forms of employment and exploring how they use mathematics in their work; and (c) helping teachers with some of the administrative tasks they have to do that draw on mathematical skills.

Learning experiences for children in mathematics should ensure that children enjoy learning mathematics, by providing opportunities to: (a) experience the sense of pleasure that comes from solving a problem or a mathematical puzzle; (b) have their curiosity stimulated by formulating their own questions and investigating mathematical situations; (c) play small-group games that draw on mathematical skills and concepts; (d) experiment with pattern in numbers and shapes and discover relationships for themselves; and (e) have some beautiful moments in mathematics where they are surprised, delighted or intrigued.

Learning experiences for children that reflect the application of mathematics to other curriculum areas could include, for example: (a) collecting, organizing, representing and interpreting data arising in science experiments or in enquiries related to historical, geographical and social understanding; (b) drawing up plans and meeting the demands for accurate measurement in technology and in design; (c) using mathematical concepts to stimulate and support the exploration of pattern in art, dance and music; and (d) using mathematical skills in cross-curricular studies such as 'transport' or 'a visit to France'.

Primary school teachers should include as one of their aims for teaching mathematics: to promote awareness of some of the contributions of various cultures to the body of mathematical knowledge. This can be a fascinating component of history-based cross-curricular projects, such as the study of ancient civilizations.

Using and applying mathematics is not just something for children to do after they have learnt some mathematical content, but should be integrated into all learning and teaching of the subject. Sometimes an appropriate approach to planning a sequence of mathematics lessons might be: introduce some new concept or skill; practise it; apply it in various problems. But not always! Sometimes a real-life problem that draws on a wide range of mathematical ideas can be used as a meaningful context in which to introduce some new mathematical concept or to provide a purposeful stimulus for children to extend their mathematical skills.

Three areas of skills to be developed in teaching children to use and apply mathematics are; (a) problem-solving strategies; (b) reasoning mathematically; and (c) communicating with mathematics.

To develop the key processes involved in using and applying mathematics children should have opportunities to use mathematics in a range of tasks, including:

- (a) activities within their everyday experience in the classroom, such as planning their timetable for the day, or grouping children for various activities;
- (b) identifying and proposing solutions to genuine problems, such as where in the playground staff should park their cars;
- (c) tackling artificial but realistic problems, such as estimating the cost for a family of four to go on a two-week holiday on the Norfolk Broads;
- (d) applying mathematics in practical tasks, such as making a box to hold a set of calculators;
- (e) solving mathematical problems, such as finding two-digit numbers that have an odd number of factors; and
- (f) pursuing mathematical investigations, such as 'find out as much as you can about the relationships between different paper sizes (A5, A4, A3, and so on)'.

In developing numeracy, children in primary schools should learn across the curriculum to:

- (a) represent and model situations using mathematics, using a range of tools and applying logic and reasoning in order to predict, plan and try out options;
- (b) use numbers and measurements for accurate calculation and an understanding of scale, in order to make reasonable estimations;
- (c) interpret and interrogate mathematical data in graphs, spreadsheets and diagrams, in order to draw inferences, recognise patterns and trends, and assess likelihood and risk; and
- (d) use mathematics to justify and support decisions and proposals, communicating accurately using mathematical language and conventions, symbols and diagrams.

(DCSF/QCDA, 2010:14).