



هيئة التعليم

EDUCATION INSTITUTE

# **Mathematics workshop 5 for teachers of Grades 7 to 12**

## **Teacher's pack: Part 1**

**Developed for the Education Institute by CfBT**

# Part 1: Contents

<b>Introduction</b>	<b>3</b>
Aims of the workshop	3
Workshop programme	4
Objectives of each session	5
Materials you need to bring to the workshop	7

# Introduction

## Aims of the workshop

The purpose of this workshop is to continue to introduce the curriculum standards for mathematics and to discuss the implications for planning the curriculum, teaching, learning and assessment.

The workshops as a whole aim to help subject leaders and teachers to:

- become more familiar with the new curriculum standards;
- consider the implications of the standards for planning, teaching and assessment;
- start or refine the planning of a mathematics scheme of work based on the standards, and related lesson plans;
- support colleagues as they implement the standards.

After this workshop, you will need to:

- discuss with your school principal, and SSO support team, any implications of the workshop;
- feed back to other colleagues what has been learned on the workshop and discuss any action needed;
- put into practice as much as possible of what you have learned.

## Workshop programme

### Day 1: Number and algebra

08:00	Registration	
Session 1 08:30–10:00	Number to algebra	90 minutes
Session 2 10:30–12:00	The distributive law	90 minutes
Session 3 13:00–14:30	Mathematical modelling	90 minutes
Session 4 15:00–16:30	Report from School 1	90 minutes

### Day 2: Geometry and ICT

10:45	Registration	
Session 5 11:10–12:30	Dynamic geometry 1	80 minutes
Session 6 13:30–14:50	Dynamic geometry 2	80 minutes
Session 7 15:10–16:30	Report from School 2	80 minutes

### Day 3: Data handling

10:45	Registration	
Session 8 11:10–12:30	Interpreting graphs and diagrams 1	80 minutes
Session 9 13:30–14:50	Interpreting graphs and diagrams 2	80 minutes
Session 10 15:10–16:30	Report from School 3	80 minutes

### Day 4: Problem solving

10:45	Registration	
Session 11 11:10–12:30	Themes through the grades	80 minutes
Session 12 13:30–14:50	The normal distribution	80 minutes
Session 13 15:10–16:30	Report from School 4	80 minutes

### Day 5: Applications and ICT

10:45	Registration	
Session 14 11:10–12:30	Applications of mathematics	80 minutes
Session 15 13:30–14:50	Using ICT	80 minutes
Session 16 15:10–16:20	Summing up	70 minutes

## Objectives of each session

### Day 1: Number and algebra

#### Session 1: Number to algebra

By the end of the session teachers will:

- know how algebra is developed through the mathematics standards;
- have considered how diagnostic and formative assessment can be used effectively to inform planning;
- have discussed ways of teaching algebra.

#### Session 2: The distributive law

By the end of the session teachers will:

- have looked at the links between number and algebra;
- have considered strategies for teaching algebra;
- have seen how topics in algebra develop through the grades.

#### Session 3: Mathematical modelling

By the end of the session teachers will:

- have looked at some exercises to help students turn word problems into mathematical statements;
- have considered some strategies for teaching sequences;
- have studied some investigations that lead to generalisations.

#### Session 4: Report from School 1

By the end of the session teachers will:

- have heard how other colleagues have implemented the standards;
- have discussed progress made by students;
- have considered how diagnostic and formative assessment can be used to inform planning.

### Day 2: Geometry and ICT

#### Sessions 5 and 6: Dynamic geometry 1 and 2

By the end of the sessions teachers will:

- have practised using dynamic geometry software;
- have considered some strategies for teaching transformation geometry, geometrical constructions and theorems;
- have planned some activities for use in the classroom.

#### Session 7: Report from School 2

By the end of the session teachers will:

- have heard how other colleagues have implemented the standards;
- have shared their own reflections with the other teachers;
- have used ICT to draw a wide range of graphs.

## Day 3: Data handling

### Sessions 8 and 9: Interpreting graphs and diagrams 1 and 2

By the end of the sessions teachers will:

- have considered some strategies for teaching students to interpret graphs and diagrams;
- have designed some questions to ask students;
- have looked at some exercises to help students interpret graphs.

### Session 10: Report from School 3

By the end of the session teachers will:

- have heard how other colleagues have implemented the standards;
- have revisited the data handling cycle in statistics and considered the implications for teaching and learning;
- have considered criteria for assessing statistical investigations.

## Day 4: Problem solving

### Session 11: Themes through the grades

By the end of the session teachers will:

- have identified some themes that can be explored at different levels through different grades;
- have engaged in some investigative work to develop an extended theme;
- have thought about other developmental strands within the standards and how they might be developed.

### Session 12: The normal distribution

By the end of the session teachers will:

- understand probability distributions
- be able to identify some common probability distributions;
- know the characteristics of the normal distribution;
- appreciate the importance of the normal distribution.

### Session 13: Report from School 4

By the end of the session teachers will:

- have heard how other colleagues have implemented the standards;
- have discussed progress made by students;
- have considered how diagnostic and formative assessment can be used to inform planning.

## Day 5: Applications and ICT

### Session 14: Applied mathematics

By the end of the session teachers will:

- have reviewed the standards relating to applications;
- have considered the significance of mathematical models;
- have looked at the mathematics of motion;
- have used software to do vector algebra.

### Session 15: Investigating with ICT

By the end of the session teachers will:

- have considered some strategies for teaching using ICT;
- have explored some mathematical problems using ICT;
- have practised using mathematical software.

### Session 16: Summing up

By the end of the session teachers will:

- have watched videos tailored to the local context;
- have reflected on the workshops.

## Materials you need to bring to the workshop

When you come to the second workshop, please bring with you:

- *Curriculum Standards for mathematics: Grades K to 12*
- a writing pad on which to make notes.

Each day you will need to bring with you Part 2 of the *Teacher's pack* that you will be given on the first day of the workshop.

Explain that during the workshop colleagues from several schools will show the group how they have been implementing the curriculum standards. There will be opportunities for questions and discussion.

If your school is one of those chosen to make a presentation, your course tutor will contact you to explain what is required and to offer any help that you need.