



هيئة التعليم

EDUCATION INSTITUTE

Mathematics workshop 1

for teachers of Grades 1 to 12

Trainer's notes

Developed for the Education Institute by CfBT

Acknowledgements

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Introduction

These materials are intended to help School Support Organisations (SSOs) and other trainers to plan and run the first of a series of workshops for subject leaders and teachers of mathematics in Qatar’s Independent Schools. The complete pack of materials consists of *Trainer’s notes*, a *Teacher’s pack* and a CD-ROM with a set of PowerPoint presentations.

The purpose of the workshops is to introduce the curriculum standards for mathematics and to discuss the implications for planning the curriculum, teaching, learning and assessment. It is recommended that at least two teachers from each school attend the workshop and that the same teachers attend throughout.

Each workshop consists of 16 sessions over five taught days, four sessions of 90 minutes on the first day and three sessions of 80 minutes on each of the other days.

The sessions are written with the assumption that they are being taught in a language that all the audience understands. If interpretation is required, you will need to reduce the quantity of material in each session by about one third.

Before the workshop starts

You will need to prepare a programme for the workshop, tailoring times of sessions to suit your circumstances. As an example, you might plan a week like this:

Day 1		Days 2 to 5	
Registration	08:00	Registration	10:45
Session 1	08:30–10:00	Session 1	11:10–12:30
Coffee	10:00–10:30	Lunch and prayers	12:30–13:30
Session 2	10:30–12:00	Session 2	13:30–14:50
Lunch and prayers	12:00–13:00	Tea	14:50–15:10
Session 3	13:00–14:30	Session 3	15:10–16:30
Tea	14:30–15:00		
Session 4	15:00–16:30		

You will also need to prepare a letter of invitation to send with the programme to each teacher attending, giving details of the venue and the times of the sessions, and so on. This letter should be agreed in advance with the Education Institute.

With your letter and the programme, you should send a copy of the *Teacher’s pack: Part 1*. Your letter should ask teachers to study this pack carefully before coming to the workshop. In particular, they should read the two articles.

You should either provide at the workshop or ask teachers to bring with them on each day their copy of *Curriculum Standards for mathematics: Grades K to 12* and *Sample lesson plans for mathematics: Grades 1 to 12*. Other materials that they need to bring are indicated in the *Teacher’s pack: Part 1*.

Your letter should mention that there will be tasks to do to follow up each workshop.

Some points to consider

When you are planning this workshop, you will need to bear in mind that some of the teachers may already be familiar with the new curriculum standards and may have some experience of working with them in the classroom, whereas others will be considering them for the first time. This local experience needs to be drawn upon when you are leading the sessions.

After the workshop, you will probably be providing school-based support for many of the schools represented. The responses made by individual teachers to the various sessions should help you to tailor your school-based support to the needs of the individual teachers and their schools.

Like any other training, the workshops will be more effective if careful attention is paid to relating the sessions to participants' own practices and beliefs, and to placing them in a broader programme of school-based professional development where reflection, individually and with colleagues, is a major aspect.

Aims of the workshop

The purpose of the five-day mathematics workshops is to consider the curriculum standards for mathematics and to discuss the implications for planning the curriculum, teaching, learning and assessment.

The workshops aim to help teachers to:

- become more familiar with the new curriculum standards;
- consider further 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 their colleagues as they implement the standards.

Throughout the workshop, time is allowed for teachers to study sections of the curriculum standards, to consider points for action arising from the sessions, and to make brief notes.

Workshop outline

Pre-workshop reading

- Reading the articles:
 - *Designing the curriculum: issues to consider*
 - *Teaching time for Arabic, English, mathematics and science: Grades 1 to 12*

Day 1: Using the standards

08:00	Registration	
Session 1 08:30–10:00	The mathematics standards General introduction to the standards	90 minutes
Session 2 10:30–12:00	Teaching and learning 1 Characteristics of effective teaching	90 minutes
Session 3 13:00–14:30	Planning 1 Planning an overview of a year's teaching based on the standards	90 minutes
Session 4 15:00–16:30	The reasoning and problem solving strand	90 minutes

Day 2: The shape of lessons and effective teaching

10:45	Registration	
Session 5 11:10–12:30	Teaching and learning 2 Beginning lessons	80 minutes
Session 6 13:30–14:50	Teaching and learning 3 Main teaching activities	80 minutes
Session 7 15:10–16:30	Teaching and learning 4 Ending lessons	80 minutes

Day 3: Planning a unit of work

10:45	Registration	
Session 8 11:10–12:30	Planning 2 Planning a unit of work	80 minutes
Session 9 13:30–14:50	Continued	80 minutes
Session 10 15:10–16:30	Assessment Planning assessment activities	80 minutes

Day 4: Planning a lesson

10:45	Registration	
Session 11 11:10–12:30	Planning 3 Planning a lesson	80 minutes
Session 12 13:30–14:50	Continued	80 minutes
Session 13 15:10–16:30	Selecting resources Evaluating textbooks	80 minutes

Day 5: Leading developments

10:45	Registration	
Session 14 11:10–12:30	Leading developments 1 Establishing the role of the subject leader	80 minutes
Session 15 13:30–14:50	Leading developments 2 Practising microteaching and evaluating lessons	80 minutes
Session 16 15:10–16:30	Leading developments 3 Action planning and summing up	80 minutes

Follow-up tasks

These tasks will include:

- discussing with the school principal, and the school’s SSO support team, any implications of the workshop and what would help to maximise the benefits to the school;
- feeding back to other colleagues what has been learned on the workshop and discussing what action is needed;
- developing or refining further their scheme of work, including:
 - developing in detail one or more units of work;
 - matching textbooks to the units;and bringing their scheme of work/units to the next workshop to discuss with colleagues;
- planning, teaching and evaluating a lesson based on their new scheme of work, ready to discuss at the second workshop.

Objectives of each session

Day 1: Using the standards

Session 1: The mathematics standards

By the end of the session teachers will:

- know the aims of the workshop and the programme for the five days;
- be familiar with the main features of the new curriculum standards for mathematics.

Session 2: Teaching and learning 1 Characteristics of effective teaching

By the end of the session teachers will:

- understand some of the implications of the standards for teaching and learning;
- be able to identify some features of effective teaching and learning;
- be familiar with the purposes of the sample lesson plans for mathematics.

Session 3: Planning 1

Planning an overview of a year's teaching based on the standards

By the end of the session teachers will:

- understand how the curriculum standards, a scheme of work, lesson plans and published materials are complementary parts of a new approach to teaching;
- be able to use the standards and scope and sequence charts to plan an overview of a year's teaching for a grade in their school.

Session 4: The reasoning and problem solving strand

By the end of the session teachers will:

- understand the nature of the reasoning and problem solving strand of the mathematics standards and how it relates to the other three strands;
- have begun to consider the implications of the reasoning and problem solving strand for teaching and learning.

Day 2: The shape of lessons and effective teaching

Session 5: Teaching and learning 2

Beginning lessons

By the end of the session teachers will:

- have considered some ways to begin and end lessons;
- be able to identify features of effective oral and mental work in mathematics;
- have developed some ideas for oral and mental starters.

Session 6: Teaching and learning 3

Main teaching activities

By the end of the session teachers will:

- have considered some ways in which effective teaching can be developed in main teaching activities;
- have considered some strategies for catering for the most and least able students in the class.

Session 7: Teaching and learning 4

Ending lessons

By the end of the session teachers will:

- understand the purposes of a consolidation phase in a lesson;
- have developed some ideas for rounding off a lesson effectively.

Day 3: Planning a unit of work

Sessions 8 and 9: Planning 2

Planning a unit of work

By the end of the sessions teachers will:

- have planned a detailed unit of work to cover several hours of teaching.

Session 10: Assessment

Planning assessment activities

By the end of the session teachers will:

- understand the nature of formative and summative assessments;
- have begun to plan assessment activities to incorporate into day-to-day lessons.

Day 4: Planning a lesson

Sessions 11 and 12: Planning 3

Planning a lesson

By the end of the sessions teachers will:

- be able to plan a lesson to fit into a unit of work.

Session 13: Selecting and using resources

Evaluating textbooks

By the end of the session teachers will:

- be able to develop criteria for evaluating textbooks;
- be able to match specific objectives to units and pages in selected textbooks and vice versa;
- have begun to consider objectives for which no materials exist.

Day 5: Leading developments

Session 14: Leading developments 1

Establishing the role of the subject leader

By the end of the session teachers will:

- have considered the role of the subject leader in implementing the standards.

Session 15: Leading developments 2

Practising micro-teaching and evaluating lessons

By the end of the session teachers will:

- have considered some strategies for developing and evaluating effective teaching.

Session 16: Leading developments 3

Action planning and summing up

By the end of the session teachers will:

- have considered some ways of supporting colleagues;
- have identified some of the action needed to implement the standards successfully in their schools.

Preparing for the workshop: practical arrangements

Before the workshop, you will need to check out practical matters such as:

- the venue, including car parking and arrangements for coffee, lunch and tea;
- workshop numbers and participating schools;
- resources needed every day, including a computer equipped with Microsoft PowerPoint, a video recorder and projection facilities (full details of the resources needed are on pages 12 and 13);
- furniture arrangements (preferably workshop style with tables);
- any displays that you may wish to have;
- interpretation and translation facilities.

You will also need to prepare a workshop register, with names of schools and details of posts held (for example, whether teachers are mathematics supervisors, subject leaders or teachers).

Other preparation consists mainly of making sure that you are familiar with the workshop materials and other publications.

- **Teacher's pack: Parts 1 and 2, and Handouts 4.3, 8.1a–c and 13.2**
You will need to prepare one copy of the *Teacher's pack* for each teacher attending the workshop.

Part 1 will need to be sent to teachers in advance of the workshop together with your letter of invitation and the workshop programme.

Part 2 should be given out at the start of the first day. This contains:

- handouts for particular sessions;
- the gap tasks to be completed before the next workshop;
- five evaluation sheets, one for each of the five workshop days;
- reduced copies of all the slides used on the workshop.

Handouts 4.3, 8.1a–c and 13.2 are separate from the rest of the *Teacher's pack*. These too should be copied for each teacher, but should not be distributed until the relevant point of Sessions 4, 8 and 13.

- **Video clips**

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Teachers attending the workshop will need to understand English to gain the maximum benefit from the video. Alternatively, you will need to ask an interpreter to provide simultaneous translation.

The video extracts are not intended as examples of 'perfect' teaching. They have been chosen so that teachers can discuss them as part of their professional development. You should study the video in advance in order to find out how it fits into the session and to anticipate issues or questions it may raise.

Resources needed

On all five days

For the trainer

- *Trainer's notes*
- Copy of the *Teacher's pack*
- Computer attached to projection facilities, with Microsoft PowerPoint
- Video recorder linked to large screen, and the workshop video
- Whiteboard or flipchart
- *Curriculum Standards for mathematics: Grades K to 12*
- *Sample lesson plans for mathematics: Grades 1 to 12*

For each teacher

- *Teacher's pack*

Either provide or ask each teacher to bring to each taught day

- *Curriculum Standards for mathematics: Grades K to 12*
- *Sample lesson plans for mathematics: Grades 1 to 12*

Day 1

For the trainer

- The PowerPoint slides for Day 1: Presentation 1.ppt, Presentation 2.ppt, Presentation 3.ppt, Presentation 4.ppt
- Extra copies of Handouts 3.3 and 3.5 from the *Teacher's pack*
- Copies of the evaluation form for Day 1 (see back of *Trainer's notes*)

For each teacher

- A calculator
- Handout 4.3 (to be given out at the relevant point of Session 4)

Day 2

For the trainer

- The PowerPoint slides for Day 2: Presentation 5.ppt, Presentation 6.ppt, Presentation 7.ppt
- Copies of the evaluation form for Day 2 (see back of *Trainer's notes*)

Day 3

For the trainer

- The PowerPoint slides for Day 3: Presentation 8.ppt, Presentation 10.ppt
- Extra copies of Handouts 8.2, 8.3 and 8.4 from the *Teacher's pack*
- Copies of the evaluation form for Day 3 (see back of *Trainer's notes*)

For each teacher

- For Sessions 8 and 9, Handouts 8.1a, 8.1b and 8.1c (to be given out at the relevant point)

For each school group

- Mathematics textbooks brought by teachers

Day 4

For the trainer

- The PowerPoint slides for Day 4: Presentation 11.ppt, Presentation 13.ppt
- Plain A4 paper
- Actual resources, or video demonstrating the use of particular resources, to show teachers in the last part of Session 12
- Interactive whiteboard (optional)
- A selection of textbooks for teaching mathematics (optional)
- Copies of the evaluation form for Day 4 (see back of *Trainer's notes*)

For each teacher

- Handout 13.2 (to be given out at the relevant point in Session 13)

For each school group

- Mathematics textbooks
- Examples of lesson plans that they have developed themselves (one per teacher up to a maximum of three per school group)

Day 5

For the trainer

- The PowerPoint slides for Day 5: Presentation 14.ppt, Presentation 15.ppt, Presentation 16.ppt
- Copies of the evaluation forms for Day 5 (see back of *Trainer's notes*)

For each group

- Large sticky notes
- Felt pens
- Two large sheets of paper from the flipchart

Tips for using your trainer's notes

Some tips are provided here for trainers who are relatively new to the training role.

- If you are teaching the workshop with a colleague, you will need to agree how to manage your contributions. For example, you could allocate particular sessions to particular trainers, alternate contributions within a session, divide into separate groups for some or all sessions, and so on.

- If your workshop will involve interpreters, you will need to reduce the amount of material in each session by about one third, particularly if the translation is consecutive rather than simultaneous. If possible, try to brief the interpreters on key points of the training in advance. Discuss how you and the interpreter will work during presentations to the whole group and during group work.
- When you are giving a presentation, make sure that you are familiar with the notes and don't have to pause constantly in order to refer to them. Remember to leave time for any interpreter to translate. If you are sharing the teaching of a session, your partner can then check against the workshop notes while you are leading, and can mention any omitted points before they take their own turn.
- Don't read out PowerPoint slides to your audience. Instead, refer to the accompanying workshop notes to explain, elaborate or make supplementary points. Annotating a printout of the slide can be helpful. Leave the slide in place long enough for the group to read all the points on it.
- When you are using video clips, make it clear that extracts from lessons are designed to illustrate aspects of practice and to create discussion points, and are not examples of perfect or model lessons.
- Aim to practise using the video recorder before you start running the workshop, so that you are familiar with the controls. Modern equipment, in particular, has a nasty habit of going into stand-by mode and over-riding all your settings if left unattended for more than a few minutes. This includes rewinding the tape that you have carefully set to the right place for viewing!
- If you are setting individual or small group tasks, make sure that you have a suitable arrangement of tables, make the task clear and set time limits. With longer tasks, warn the groups when there are only 5 minutes left.
- For tasks that involve study of the standards, it may help to put the numbers of the pages to be studied on a flipchart before the session begins.
- When you are taking feedback from group tasks, use the workshop notes as a 'crib sheet' to check points have been mentioned. If an opinion is expressed that you think may be an isolated or minority view, it may help to check whether other teachers share that view to create debate about it.
- If you are using a checklist to summarise a discussion, try to ensure that participants feel that their comments are valued, not usurped by your slide.
- Work flexibly to the indicative times for each session. Without making it obvious, keep a watchful eye on the clock.
- If time for questions runs out, or if you are asked a question to which you don't know the answer, make a note of the question on a flipchart, or on a wall poster put up for the purpose, so that you can deal with it later.
- You will be working from prepared notes because it is important that all workshop members are given the same information and an opportunity to consider the same range of issues. However, there are opportunities to draw on your own and local experience as well. This will help you to feel that it is your workshop and thus make it more effective for all teachers.
- If you are likely to repeat the workshop, you may find it useful to consider the aggregated data from the evaluation forms completed by the participants. This will help you to make adjustments when you plan the workshop for a second time.