

# Day 1 Session 3

## Planning 1

90 minutes

### Objectives

By the end of this 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.

### Resources

#### For the trainer

- Computer with data projector, Microsoft PowerPoint and Presentation 3.ppt
- Whiteboard or flipchart
- A few calculators
- Extra copies of Handouts 3.3 and 3.5 from the *Teacher's pack*
- *Curriculum Standards for mathematics: Grades K to 12*

#### For each teacher

- *Teacher's pack*  
Handouts 3.1–3.5
- *Curriculum Standards for mathematics: Grades K to 12*

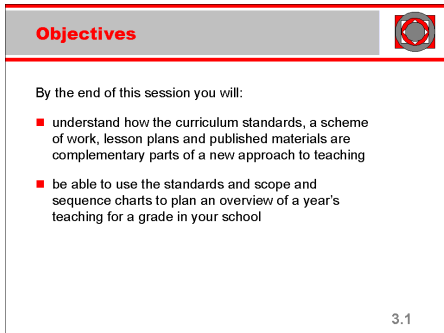
### Session outline

<b>Introduction</b> Slides 3.1–3.2	Whole group presentation	5 minutes
<b>The approach to planning</b> Slides 3.3–3.5 Handouts 3.1–3.3	Whole group presentation Task 1: Producing an overview	35 minutes
<b>Identifying topics for units</b> Slide 3.6 Handout 3.3 [continued]	Whole group presentation Task 2: Identifying topics for units	25 minutes
<b>Identifying objectives for a unit</b> Handouts 3.4–3.5	Whole group presentation Task 3: Identifying objectives from the standards Task 4: Identifying objectives for a unit	20 minutes
<b>Summary</b> Slide 3.7	Summary of key points	5 minutes

## Introduction

5 minutes

Use **slide 3.1** to introduce the objectives for the session.



**Objectives**

By the end of this session you 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 your school

3.1

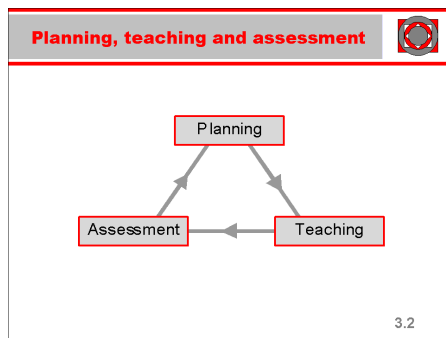
Before the session starts, brief any interpreter about the key points of the session.

Make sure that each teacher has a copy of the standards.

Load **Presentation 3.ppt**.

Say that this session, and sessions on Days 3 and 4, will focus on planning. Stress again that each school can develop its own policies for how teachers can plan and teach the curriculum. This session will focus on principles that ensure that plans are a useful guide to teaching.

Show **slide 3.2** to remind everyone of the planning → teaching → assessment cycle.



Make these points.

- Planning is more effective when it involves professional dialogue and collaborative teamwork. It has a direct impact on the quality of teaching and learning.
- Subject leaders and experienced teachers have a leading role to play in establishing a common planning process in their department and helping colleagues to implement it.
- Schools will be at different stages of development with their planning. Some teams of mathematics teachers may need to make only minor adjustments to their current schemes of work and teaching plans. They should use this session to reflect on their planning processes and to consider what they might do differently next year.

## The approach to planning

35 minutes

Say that you are going to start by summarising the planning process.

Show **slide 3.3**. Explain that the slide provides an overview of what is involved in each level of planning.

Connected levels of planning		
<p>The standards</p> <ul style="list-style-type: none"> <li>objectives for each grade, providing breadth, balance and progression for all students</li> </ul>	<p>A scheme of work: long-term planning</p> <ul style="list-style-type: none"> <li>grouping objectives together to form units</li> <li>identifying objectives for higher and lower attainers</li> <li>allocating teaching time to units</li> <li>making links across and ordering the units</li> <li>outlining how to teach each unit to meet the objectives</li> </ul>	<p>Lesson plans: short-term planning</p> <ul style="list-style-type: none"> <li>deciding in detail how to teach the objectives</li> <li>planning day-to-day lessons</li> </ul>

3.3

Explain that the standards are objectives for what should be taught to all students. The first step (the middle column) in using them is to create a long-term plan or scheme of work, which translates the standards into a programme of study. The scheme of work will then guide teachers when they create their short-term lesson plans (the right-hand column).

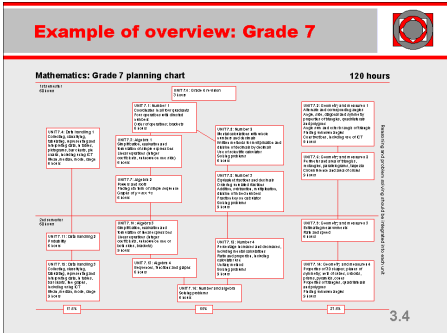
Explain that different terms are sometimes used to describe a scheme of work. For example, some schools call a *scheme of work* a *curriculum plan*; some might call it a *programme of study*.

Say that there is no right or wrong way to set out a scheme of work. The main criterion is that teachers in the school find it helpful and can base their short-term or day-to-day lesson plans upon it. Creating a scheme of work involves, for each grade:

- grouping the standards together into coherent, manageable teaching units, and identifying any additional content that the school may wish to incorporate;
- identifying relevant objectives from the standards for higher or lower attaining students – these standards can be drawn from the relevant grade, or a higher or lower grade;
- indicating the number of teaching hours or lessons for each unit;
- ordering the units across the two semesters of the school year so that they build on preceding work, link with other units and prepare students for the next grade;
- developing sufficient detail in each unit for teachers to be able to create their lesson plans from the units.

Explain that this session will focus on the first, third and fourth bullets in the middle column of slide 3.3: creating the overall plan for the units in given grade, ordering and linking the units and allocating time to them. If time allows, some work on the second bullet, identifying objectives, will be included.

Say that a diagram or a list is appropriate for presenting an overview of the units contained in a scheme of work. The example on **slide 3.4**, reproduced on **Handout 3.1**, is an extract from a scheme of work for mathematics. It shows how units of work could be organised and sequenced throughout Grade 7.



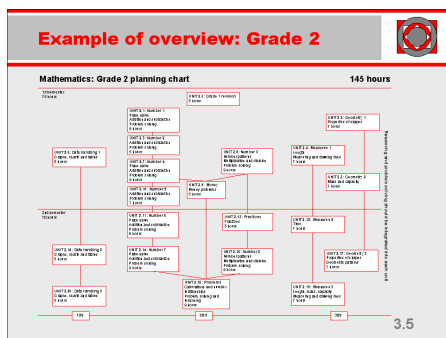
Make these points.

- The overall teaching time of 120 hours is at the minimum of the range for Grades 7 to 9 (see the Introduction to the standards, page 12). The equivalent for Grades 1 to 6 would be 145 hours, for Grades 10 to 12 foundation would be 90 hours, and for Grades 10 to 12 advanced 135 hours. The minimum of the range is used so that revision and assessment units can be added at relevant points.
- The balance between the teaching time for the three strands of number and algebra, geometry and measures and data handling is indicated in the percentages of 55%, 27.5% and 17.5%, shown at the bottom line. These allow the overall number of teaching hours for a given strand to be calculated.
- Reasoning and problem solving objectives are included in each unit.
- The flow of the units reflects continuity and progression in students' learning throughout the school year.
- Some units are linked because they are dependent on others being taught first. For example, the unit *Data handling 2* should follow *Data handling 1*. On the other hand, other units are not dependent on others. For example, it is immaterial whether *Number 3* is taught before or after *Geometry and measures 2*.
- Each unit shows the unit number, a title, a brief description of the content, and the number of teaching hours. A school would be more likely to indicate the number of lessons (for example, 6 teaching hours would be eight 45-minute lessons).
- The sequences usually provides one or more opportunities to revisit particular standards or groups of standards throughout the course of the year. This gives students the chance to consolidate their learning in a range of contexts and to make connections between different aspects of the subject.
- The number of units could be more or less, provided that the overall number of teaching hours remains the same. It is common to have shorter and therefore more units in Grades 1 to 6, perhaps 20 units per year, and longer and therefore fewer units as students get older, perhaps 15 to 16 per year in Grades 7 to 9, and around 12 per year in Grades 10 to 12.
- The information on the slide/handout could just as easily be presented in a table. The advantage of the diagram is that it shows some relevant links.

Expand on this point. Stress that it is always possible to teach two or even three units simultaneously in order to emphasise connections between aspects of mathematics, e.g. a unit on place value, a unit on measures, a unit on data handling.

Pause for questions.

Continue by explaining that the distribution of units is likely to be different in different grades. Show **slide 3.5**, reproduced on **Handout 3.2**, to show a possible distribution of units in Grade 2.



Refer everyone to pages 12–14 of the Introduction to the standards. Using the flipchart, show teachers how to calculate the number of units they would like to have in each semester for each strand. Choose a grade relevant to the teachers, and work out the teaching time per semester, the number of hours for each strand, and the possible distribution of units, as in the example below.

### Example: Grade 10 foundation

*Teaching time per year:*

*90 hours, 45 hours in each semester*

*Balance between strands:*

*about 55% for number and algebra (50 hours), 30% for geometry, trigonometry and measures (27 hours), and 15% for data handling (probability and statistics) (13 hours)*

*Number of units per year:*

*Number and algebra: Semester 1: one unit of 9 hours and two of 8 hours;*

*Semester 2: one unit of 7 hours and three of 6 hours*

*Geometry and measures: three units of 7 hours and one of 6 hours*

*Data handling: one unit of 8 hours and one of 5 hours*

See page 12 of the standards.

See page 14 of the standards.

### Task 1: Producing an overview

Ask teachers to work in school groups and to use **Handout 3.3** to plan the units for one of the grades in their school. They should list the units on the handout, completing only the columns headed ‘Unit no.’, ‘Title’ and ‘Hours’ at this stage. Say that the number of the unit is best if it also indicates the grade, so that each unit has a unique number. For example, unit 5.7 would be the seventh unit for Grade 5.

You may wish to offer spare copies of Handout 3.3 and a calculator to any groups that need them.

Allow 15 minutes. Groups that finish quickly can complete the task for the other grades in their school.

Before moving on, explain to the whole group how to complete the column headed ‘Lessons’. To do this they will need to translate the number of hours into the number of lessons for their school. The result of the calculation may not be an exact number of lessons and will need to be rounded up or down. For example, if lessons are 45 minutes long, a time of 7 hours would translate to  $9\frac{1}{3}$  lessons, or 9 lessons rounded down to the nearest whole number. If lessons are 55 minutes long, 7 hours would translate to  $7\frac{7}{11}$  lessons, or 8 lessons rounded up to the nearest whole number.

## Identifying topics for units


25 minutes

Say that to complete the table in Handout 3.3 school groups will need to fill in the column headed 'Topics'. For this, it is easiest to use the scope and sequence charts to see a summary of what will need to be taught during the grade.

Explain that it is easier to fill in all the topics for a particular strand in one go. It may be easier to fill the topics for the data handling units first, since there are fewer of them, then geometry and measures, then number and algebra.

Stress that topics may be revisited during the year in more than one unit in order to revise and extend them. Every topic should be included at least once.

Illustrate this with an example from Grade 4. Ask teachers to assume that they have decided on three 5-hour units on data handling for Grade 4. Ask them to look at the data handling section of the scope and sequence chart for Grade 4 (page 26 of the standards), then show **slide 3.6**.

**Example: data handling in Grade 4** 

Unit	Title	Topics	Hours	Lessons
4.6	Data handling 1	Simple two-way tables Bar charts with scales (intervals of 2 and 10)	5	
4.14	Data handling 2	Carroll diagrams (two criteria) Bar charts with scales (intervals of 5 and 10)	5	
4.19	Data handling 3	Simple two-way tables Bar charts with scales (intervals of 4, 20 and 100)	5	

3.6

Make these points.

- Some of the topics are repeated and some are not.
- Teachers may at this stage want to make adjust the number of hours for each unit (although the overall number of hours for the units should stay the same). They may also want to adjust the titles of the units to make them more meaningful.
- The 'Topics' column indicates the main theme of the unit. When teachers determine the objectives for the unit, drawing from the standards, they may want to add subsidiary objectives. For example, in the Grade 4 illustration on slide 3.6, they may want to link the work on bar charts to number sequences and counting in 2s, 4s, 5s, 10s and 20s, and the work on Carroll diagrams to work on factors, multiples and primes.
- Reasoning and problem solving will need to be integrated into each unit but these objectives will be added later.

### Task 2: Identifying topics for units

Ask the school groups to continue to use **Handout 3.3** and to complete the topic columns. Allow up to 20 minutes.

## Identifying objectives for a unit

20 minutes

Say that, once the order of the units has been decided, each unit will need to be developed. The objectives for the unit should be drawn from the standards.

Objectives for reasoning and problem solving should be integrated with each unit. Ideally, the objectives should be stated in a way that shows what the most able and least able students in a grade will be taught and what they might be expected to achieve over the course of the unit.

Say that over the year every key objective for the grade should be included in at least one unit, and preferably in more than one unit.

### Task 3: Identifying objectives from the standards

Refer everyone to **Handout 3.4**. This is an example of the objectives for a unit on geometry and measures in Grade 7. The objectives are based on the standards and are set out in three main columns.

- The centre column, 'Core standards', includes the relevant key standards for the grade, drawn from the geometry and measures strand and from the reasoning and problem solving strand. These should be taught to all students.
- The left-hand column shows supporting standards that will help students who learn more slowly to consolidate what they know, understand and can do. Some of the supporting standards may be for the relevant grade and some may be drawn from the previous grade.
- The right-hand column shows extension standards that challenge more able students and extend what they know, understand and can do. Some of the extension standards may be non-key standards for the relevant grade and some may be drawn from the subsequent grade.

Ask the school groups to locate the various standards for Grades 6, 7 or 8. Allow up to 5 minutes.

### Task 4: Identifying objectives for a unit

Refer everyone to **Handout 3.5**. Ask the school groups to choose one of the units for a grade for which they have developed an overview. They should use the standards and list on the handout the core standards for their chosen unit. Remind them to include at least one reasoning and problem solving standard.

Offer spare copies of Handout 3.5 if needed. Allow 10 minutes for the task. Groups that finish quickly can start to add extension and supporting objectives.

## Summary

5 minutes

Say that a scheme of work or long-term plan is about *what* to teach and *how* to structure the taught mathematics curriculum across each semester. Show **slide 3.7** to summarise the early decisions involved.

**A scheme of work identifies:**



- teaching time for each strand of the standards
- units of work to be taught in each semester to ensure an appropriate balance across the strands
- teaching time for each unit
- teaching objectives for each unit, with all key performance standards for the grade covered over the year
- the reasoning and problem solving skills to be incorporated
- opportunities to link different aspects of mathematics and to revisit topics
- time for regular assessment and review

3.7

Say that Day 3 of the workshop will continue the consideration of the development of a scheme of work.