

Teaching and learning 3

Objectives

By the end of this 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.

Resources

For the trainer

- Computer with data projector, Microsoft PowerPoint and Presentation 6.ppt
- Whiteboard or flipchart
- Video recorder linked to a large screen
- Video clip 3: Examples of the main activity
- *Sample lesson plans for mathematics: Grades 1 to 12*

For each teacher

- *Teacher's pack*
Handout 6.1

Session outline

Introduction Slides 6.1–6.2	Whole group presentation	10 minutes
Main teaching activities Video clip 3 Handout 6.1 Slide 6.3	Whole group presentation Video clip 3 and Task 1: Identifying features of effective teaching Task 2: Strategies for supporting colleagues Small groups	40 minutes
Differentiating in whole class teaching Slides 6.4–6.5	Task 3: Identifying strategies for differentiation	15 minutes
Summary and reflection Slide 6.6	Summary of key points Task 4: Identifying further action	15 minutes

Introduction

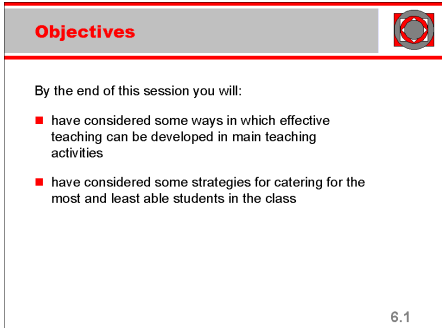
10 minutes

Remind everyone that you are focusing on some of the features of effective teaching. Explain that Session 6 is the third of four sessions on teaching and learning. Use **slide 6.1** to introduce its objectives.

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

Set up the video recorder in readiness.

Load **Presentation 6.ppt**.



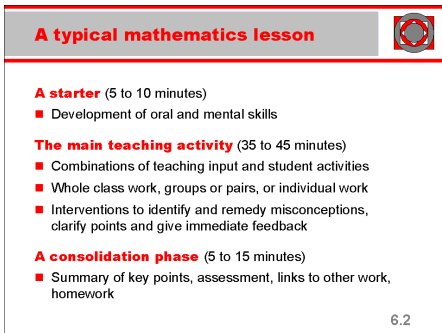
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6.1

Show **slide 6.2** to remind everyone of a typical lesson structure.



A typical mathematics lesson

A starter (5 to 10 minutes)

- Development of oral and mental skills

The main teaching activity (35 to 45 minutes)

- Combinations of teaching input and student activities
- Whole class work, groups or pairs, or individual work
- Interventions to identify and remedy misconceptions, clarify points and give immediate feedback

A consolidation phase (5 to 15 minutes)

- Summary of key points, assessment, links to other work, homework

6.2

Say that Session 5 looked at developing and maintaining oral and mental starters. In this session, the focus will be on main teaching activities.

Main teaching activities

40 minutes

Say that teachers will know the important features of good teaching. Ask them to suggest what they would see if they were watching the main part of a good mathematics lesson in their own school. List the suggested features in brief note form on a flipchart.

Confirm that effective direct teaching is interactive. It is a two-way process. Students are expected to play an active part by responding to and asking questions, contributing points to discussions, and explaining and demonstrating their solutions to the class.

Show **slide 6.3**, which summarises the key features of good main teaching sessions.

Effective main teaching involves:



- shared objectives to set expectations and make connections
- clear explanations, illustrations and demonstrations, with resources used effectively to help students to visualise
- involving students through discussion and questioning, and opportunities for them to demonstrate, explain and justify methods and solutions, orally and in writing
- pitching work at an appropriate level, ensuring challenge and success
- addressing errors and misunderstandings as they arise
- promoting problem solving and reasoning skills
- good lesson management, including pace and purpose

6.3

Expand on the seven features listed in slide 6.3 as follows, linking the points back to the notes on the flipchart as much as possible.

- Sharing the objectives for the session in words that students understand helps them to be aware of what they are expected to learn. It also helps them to recognise the progress that they are making and to see the connections between different aspects of mathematics.
- Clear explanations, illustrations, demonstrations and guided practice of the mathematics, drawing on students' previous knowledge and using resources effectively, helps students to visualise and model what they are expected to learn. Explanations are more effective when there is interaction with the students so that the teacher can judge whether the students have understood what has been taught.
- Student involvement is key. This can be achieved in part through dialogue with the whole class, groups and individuals. It is also achieved by asking students to demonstrate and explain their methods, solutions and reasoning orally and (from Grade 3) in writing.
- The standards for mathematics should help teachers to pitch the work at an appropriate level, ensuring success and challenge. In addition, teachers need to find ways to give the most able extra challenges and the least able extra support.
- It is crucial to address mistakes and misunderstandings immediately while students can still recall their reasoning. This prevents the errors from becoming established practices.
- Problem solving provides opportunities for students to communicate mathematically, to develop mathematical argument, to make connections in their thinking and so strengthen their understanding. Questions and tasks should promote problem solving and reasoning skills. Students in all grades should be expected to explain their reasoning and to justify their methods and solutions.
- Effective teaching involves good management of time, the pace and flow of the lesson, the organisation of groups of students and the teaching and learning resources. In some lessons, a lead teacher will also need to manage the deployment of a support teacher. During group work, effective teaching will involve bringing the whole class together at time to review progress, correct a misunderstanding, set additional challenges, rekindle interest or re-establish pace.

Video clip 3 and Task 1: Examples of main teaching activities

Refer teachers to **Handout 6.1** in their *Teacher's pack*. Explain that you will show extracts from the main activity in two different lessons. Ask teachers to focus their attention while they are watching the video on identifying some of the characteristics of good main teaching outlined on the handout.

Show **Video clip 3**, Examples of the main activity, which lasts about 13 minutes.

After watching the video, ask teachers to discuss in small groups how the features of effective teaching were illustrated in the lessons seen on the video. Allow about 5 minutes for the discussion.

Take some feedback, using **slide 6.3** as a prompt. Ask participants to give examples of the features they identify.

Task 2: Strategies for supporting colleagues

Finish this part of the session by asking teachers to discuss in school groups how lessons should be planned to ensure that the main teaching is effective and how they would guide and support colleagues back at school. Allow several minutes.

Take feedback and draw out these strategies:

- providing a scheme of work that is sufficiently detailed to guide teachers' day-to-day lesson planning;
- developing a resource bank of sample lessons;
- studying and discussing the teaching strategies in model lesson plans, such as those in *Sample lesson plans for mathematics: Grades 1 to 12*;
- pairing teachers to plan lessons together, so that an experienced teacher works with a less experienced teacher;
- coaching teachers by:
 - inviting them to observe a real lesson taught by an experienced teacher;
 - giving a demonstration mini-lesson using a group of colleagues as 'the class' (micro-teaching);
 - observing and giving feedback on a lesson taught by a colleague;
 - team-teaching a lesson;
 - watching a video of a lesson;and discussing the lesson afterwards;
- referring teachers to education research articles that discuss effective teaching.

You will need to explain the context of the lessons. The films were made in large comprehensive schools in England. The schools are mixed, with about 900 students from Grade 6 to Grade 12.

If possible, the groups should include teachers from different schools.

Differentiating in whole class teaching

15 minutes

Point out that in any class students will have a range of ability: some will learn faster than others. Teachers need to make sure that they stretch the capabilities of the most able in the class and support the learning of those who learn more slowly so that they are not left behind.

Remind everyone that the standards are numbered, and those in shaded rectangles, e.g. 1.2, are the key performance standards that should be taught to all students and that all students should master. The national tests are based on these standards. The remaining non-key standards represent extension or enrichment objectives for the more able, or consolidation objectives for those who learn more slowly. As such, they will not necessarily be taught to all students. Some of them are key standards in an earlier or higher grade.

In group work, different tasks can sometimes be given to different groups, including for homework. For example, the most able students do not need the same amount of practice to consolidate their learning and can be given extra challenges instead. Students who learn more slowly may need an extra lesson for consolidation while other students are introduced to an extension topic.

In whole class work, open-ended questions to the whole class and closed questions targeted at particular groups are useful strategies.

Task 3: Identifying strategies for differentiation

Say that you would like everyone to reflect on the lessons they have seen on video and identify how the teachers catered for the most and least able in their classes. Invite them, in pairs, to choose one of the lessons and identify one way that the teacher achieved differentiation. Allow 5 minutes.

Encourage teachers from different schools to pair up and work together.

Take brief feedback. Quickly clarify any points and highlight any features that have not already been identified.

Drawing on the feedback from the paired discussion, highlight that differentiation can be achieved in a number of ways, some of which are outlined on slides 6.4 and 6.5.

Differentiation: whole class work

- Using open questions, with wait-time for students to think or discuss in pairs before answering
- Using closed questions targeted at individuals or groups
- Using learning resources to support particular students
- Teaching half the class while the other half works independently

6.4

Differentiation: group work

- Giving different but linked tasks to groups or pairs – no more than three levels of difficulty across the class
- Using open-ended tasks – investigations or problems that have a range of possible answers
- Giving extension tasks to challenge more able students while others are consolidating their learning
- Using learning resources to support particular students
- Focusing the help of a teacher or support teacher on selected individuals/groups as others work independently
- Giving differentiated homework

6.5

Emphasise that the aim is to ensure sufficient challenge in the work to engage all students and to enhance their mathematical learning. Make two further points.

- Closed questions can often be used to set the scene for more open questions where students might be asked to work from the particular to the more general. For example, asking the class a closed question such as: ‘What is the result of multiplying 9 by 8?’ can set the scene for the more open question: ‘Does multiplication always make numbers bigger?’ Setting open questions such as this can provide time for teachers to focus on some direct teaching with particular groups of students.
- Students’ explanations of their strategies and methods to their teachers and to their class-mates can help others to understand that there are different ways of seeing and solving the same problem.

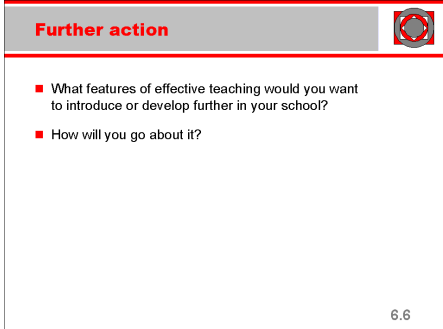
Summary

10 minutes

Task 4: Identifying further action

Ask everyone to refer again to the summaries of features of effective teaching in the main part of the lesson on **Handout 6.1**.

In school groups they should consider the two points on **slide 6.6**.



The slide is titled "Further action" and contains two bullet points. The first bullet point asks for features of effective teaching to be introduced or developed further in the school. The second bullet point asks how to go about it. The slide number "6.6" is in the bottom right corner.

Further action

- What features of effective teaching would you want to introduce or develop further in your school?
- How will you go about it?

6.6

Allow about 7 or 8 minutes for the discussion. Then take brief feedback from each group in turn to encourage the sharing of ideas.

Conclude by saying that in the next session they will consider the role of plenaries in lessons and the teaching of the consolidation phase of a lesson.