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English

Grade R Mathematics Improvement Programme



Workshop 9 Participant's Workbook

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The **Schools Development Unit (SDU)** at the **University of Cape Town (UCT)** is the mathematics technical partner to the Grade R Mathematics and Language Improvement Project. The SDU is a unit within UCT's School of Education that focuses on teachers' professional development in Mathematics, Science, Literacy/Language and Life Skills from Grade R to Grade 12. The SDU offers teacher qualifications and approved UCT short courses, school-based work, materials development and research to support teaching and learning in all South African contexts.

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Overview

Purpose

This is the ninth of twelve Grade R Mathematics Improvement Programme workshops, which form part of the Gauteng Department of Education (GDE) Grade R Mathematics and Language Improvement Project.

The purpose of this workshop is to continue assisting teachers to implement the Maths Programme in their classrooms. Participants will have the opportunity to reflect on their implementation of the Maths Programme and discuss their planning, teaching and assessment. They will also consider learner progress, and individual developmental and learning needs. Participants will reflect on appropriate assessment strategies for capturing learner progress. The workshop explores the content for Term 3 Weeks 7–10 and its classroom implementation.

References to the Grade R Mathematics Content Areas are taken from the *Curriculum and Assessment Policy Statement (CAPS): Grade R Mathematics (Final Draft)*, 2011, Department of Basic Education, South Africa.

Learning outcomes

- ◆ To reflect on the implementation of Term 3 Weeks 4–6
- ◆ To explore play-based strategies to support teaching maths in Grade R
- ◆ To deepen understanding of number concept in the Numbers, Operations and Relationships Content Area and to link these to the implementation of maths in the Grade R classroom
- ◆ To deepen understanding of appropriate assessment in Grade R
- ◆ To reflect on challenges and find solutions to implementing the Maths Programme
- ◆ To map out the Maths Programme content to be taught in Term 3 Weeks 7–10

Workshop content

- ◆ Opening and reflection (1 hour)
 - ◆ Session 1: Numbers, Operations and Relationships (1 hour)
- TEA
- ◆ Session 2: Numbers, Operations and Relationships (continued) (1 hour)
 - ◆ Session 3: Calculation in Grade R (1 hour)
- LUNCH
- ◆ Session 4: Planning for teaching (1½ hours)
 - ◆ Closing activities (30 minutes)

Opening and reflection

1 hour

Reflection involves thinking and talking about your experiences and what you have learnt. Consider the Maths workshops you have attended and complete the sentences the facilitator displays.

Reflection on implementation

The *Take back to school* task from Workshop 8, required you to do the following:

- ◆ Use *Activity Guide: Term 3* to plan and implement Term 3 Weeks 4–6 of the Maths Programme.
- ◆ Write comments in the book that you use to keep track of each learner’s progress (learner observation book), and use the ‘**Check that learners are able to**’ observation list during each of the teacher-guided activities to guide your observations and comments.
- ◆ Make notes of what worked well, what did not work well and how you resolved any challenges during your implementation of Term 3 Weeks 4–6.

In the next activities make use of your learner observation book and the notes you made when reflecting on each day’s teaching.



Activity 1

1. In your group, share your successes and challenges with implementing the Maths Programme in Term 3 Weeks 4–6. Share strategies for improving teaching and learning for the challenges you identified.

2. Discuss your use of the ‘**Check that learners are able to**’ observation list (in the eye box) during each of the teacher-guided activities.
Show members of your group your learner observation book.
Select one learner and discuss your observations of this learner’s progress.

3. Write the main points of your discussion on flipchart paper. Report back on your discussion to the large group.



Video 1

Watch the video of a teacher working with a small group of learners during the teacher-guided activity in Term 3 Week 6. The focus of our observation in this workshop is on how the teacher mediates the number activities.

Observe how the teacher works through the six activities. Notice:

- ◆ how she poses problems
- ◆ the language she uses when asking questions
- ◆ how she sets up each activity
- ◆ the questions she asks to guide the learners.



Activity 2

Refer to the teacher-guided activity (pages 58–59) in Week 6 of *Activity Guide: Term 3*.

1. Discuss how you managed this teacher-guided activity with your class.

2. Did you face any challenges? If so, how did you solve them?

Session 1: Numbers, Operations and Relationships

1 hour

In previous workshops we have discussed the Numbers, Operations and Relationships Content Area. In this session we will revisit different number topics and expand our discussion to further understand number concept. We will explore the following aspects of number and connect them to classroom practice:

- ◆ oral counting
- ◆ subitising
- ◆ representing number
- ◆ counting objects
- ◆ ordinal numbers
- ◆ calculating.

Oral counting

Children learn the correct order of number names as they play, sing, and repeat rhymes.

As we know, oral counting involves saying the number names in order. Learners sequence numbers during routine oral counting activities and during transitions. Songs, rhymes and actions make oral counting fun, but the focus is on the order of the numbers. Once learners can repeat a sequence of numbers in the correct counting order, they begin to talk about the relationship between the numbers, e.g., which number is *before*, *between* or *after* another number.



Activity 3

In your group, discuss how the following activities have promoted learning the sequence of counting words in your class:

- ◆ songs and rhymes
- ◆ number washing line
- ◆ jumping tracks.



Activity 4

Read the information on pages 69–71 and look at the diagram at the top of page 72 of the *Concept Guide*.

In your group, discuss the following aspects of number:

- ◆ different ‘meanings’ of number

- ◆ different kinds of numbers

Learners in Grade R work mostly with the whole numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10. (In Grade 1 this is extended to 20 and beyond.) We focus on counting and representing number in different ways and provide opportunities for learners to engage with numbers in different contexts.

Subitising



Activity 5

Observe the facilitator. Each time she/he flashes a card, say as quickly as you can ‘how many’ dots you see.

1. Did you count each dot one by one? Why not?

2. What do you think the benefit is of reinforcing the skill of subitising?

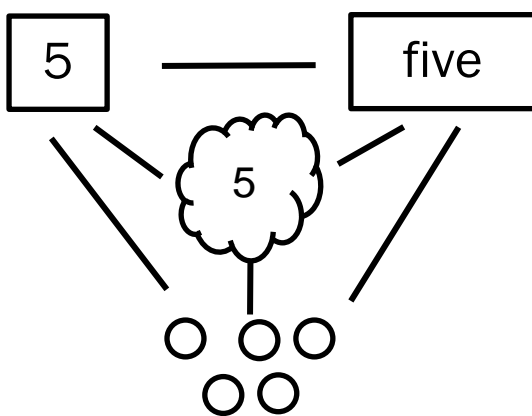
3. What activities that reinforce the ability to subitise have you used in your Term 1 and 2 maths sessions?

Refer to pages 72–73 of the *Concept Guide*.

Representing number

A number is an abstract concept. It is an idea that exists in your head. We can't see numbers, so we have to find different ways to represent (show) the number that is being referred to. Learners need to make the connection between the idea of a number, e.g., 5, and its different representations, like a collection of objects, a symbol, a word. They also need to understand that if we say, 'how many' sweets, claps, houses, birthdays, etc., five always refers to the same number of these things.

Learners need to internalise the 'how muchness' or numerosity of the number. To communicate this concept to learners, teachers need to introduce the idea using concrete objects, for example, counters. To help learners understand the concept of a number, they need to realise that numbers can be represented in different ways. Learners also need to make the connection between different representations of the number, for example an object, picture, symbol and word.



Session 2: Numbers, Operations and Relationships (continued)

1 hour

Counting objects

To count '**how many**', learners need to realise that each object in a group has a number name and that you count each object only once.

There are five counting principles that describe the process of learning to count. Once learners have understood and can apply all five of these counting principles, we are able to say that they can count.



Activity 6

Read the information on pages 74–75 of the *Concept Guide*.

1. Use the apparatus provided to demonstrate these principles as they are explained in the *Concept Guide*.
2. Discuss each principle in your group and make your own notes in the table below to explain your understanding of each principle.

One-to-one correspondence principle	
Stable order principle	
Cardinal principle	
Abstraction principle	
Order-irrelevance principle	

Ordinal numbers

We have discussed the kinds of numbers that tell you 'how many'. These are called **cardinal numbers**.

There are also numbers that indicate the position of something or someone in a series or order. These are called **ordinal numbers**.



Activity 7

Arrange the animal counters on your table according to the facilitator's instructions. Answer her/his questions about the position of the animal counters.

Session 3: Calculation in Grade R

1 hour

Learners need to understand the value of numbers and the relationships between them before they can do operations like addition and subtraction. They need to know, for example, 'how many' three is'; 3 comes before 4, after 2 and between 2 and 4; and 3 is one more than 2 and one less than 4.

Working with counters, structure beads, dot cards, and the shake-and-break game provides opportunities for learners to understand that numbers can be built up or broken down. In this way, they gradually recognise that any number is made up of many different combinations of other numbers. For example, number 5 can be made up of:

- ◆ 4 and 1
- ◆ 1 and 1 and 1 and 2
- ◆ 0 and 5.

In Grade R, learners explore different ways of building up and breaking down numbers, and adding and subtracting using counters.



Activity 8

Read the information on pages 77–78 of the *Concept Guide*.

Think about how you have used the materials provided in the Maths Programme to help learners understand number operations (calculations) and relationships. Use the materials to demonstrate this.

1. How do learners explore the concept of number in the Maths Programme using the materials provided?
2. What questions could you ask that would guide their learning? (Refer to page 78 of the *Concept Guide* for examples of questions.)

Prepare to present your discussion to the whole group.

Word problems

Grade R learners need to orally solve word problems involving addition, subtraction, and equal sharing and grouping. They also need to explain their own reasoning and ways of solving different problems.

Give learners plenty of time to think and let them use real objects (e.g. counters, fingers, structure beads) to solve the problems and check their answers.

When presenting a word problem to learners, it is important to encourage them to:

- ◆ find a strategy to solve the problem
- ◆ explain how they solved the problem
- ◆ say why they think their answer is correct.

Common addition and subtraction contexts can be presented as word problems. The way that the word problem is structured, determines how easy or difficult it is to solve. It is important to use clear, simple language when presenting word problems.

In Workshop 6 we looked at the importance of using clear, simple language and asking appropriate questions during problem-solving activities. We also designed real-world problems in contexts that learners could relate to. In Activity 9, you will discuss problem solving in more detail.



Activity 9

1. Look at the word problems below.
 - ◆ How would you solve each problem?
 - ◆ How do you think your Grade R learners would solve each problem?
 - ◆ Why are some of these problems more difficult than others?
 - ◆ Use the counters on your table to show how learners would solve the problems.

Combine	Separate
Laylah has 6 sweets. Malusi gives her 2 more. How many sweets does Laylah have altogether?	There are 8 sweets. Laylah eats 3 sweets. How many are left for Malusi?

Laylah has 5 sweets. How many more does she need to have 8?	Laylah has 8 sweets. Malusi eats some. There are 4 left. How many did Malusi eat?
Laylah had some sweets. Malusi gives her 2 more. Now she has 8. How many did Laylah start with?	Laylah had some sweets. She gave 6 sweets to Malusi. She has 2 sweets left. How many sweets did she start with?

2. Write a word problem that you could present to your Grade R learners for each of the following:

Addition: $4 + 5 =$

Subtraction: $7 - 3 =$

Equal sharing without a remainder: 8 shared between 4 learners

Equal sharing with a remainder: 5 shared between 2 learners

Session 4: Planning for teaching

1½ hours

This workshop session prepares participants for implementing Term 3 Weeks 7–10. By this stage of the year, the teacher will have noticed distinct differences between learners’ levels of progress. Term 3 builds on the content of Terms 1 and 2. Some learners will be ready for this, while others will need support and more consolidation to progress. It is important to plan and prepare for this difference in learner competence to ensure that all the content and skills of Grade R Mathematics are covered, and learners are well prepared for Term 4.



Watch the video of a teacher discussing how she deals with the range of learner competence in her class. Listen to what she says about planning and managing the difference between learners’ ability levels and how she goes about her planning in order to support the learners’ individual needs.

Note your ideas about differentiated teaching and learning in your classroom.



1. In your group, complete the planning templates for Term 3 Weeks 7–10 (Appendix A).
2. Your group will present an overview of your planning discussion to the other groups. Note the main points of your discussion on flipchart paper. Include answers to the following questions:
 - ◆ What challenges do you anticipate in implementing Weeks 7–10?
 - ◆ How can you solve each of these challenges in order to achieve successful implementation?
 - ◆ How does the teacher-guided activity provide opportunities for the teacher to assess and support the learners?
 - ◆ Do the independent small group activities allow for adequate practice of new knowledge and skills?

Closing activities

30 minutes



Activity 11

Workshop reflection: Take a few minutes to reflect on the day. Page through your *Participant's Workbook* to remind yourself of what was covered. Write down your thoughts.

Share your reflections with the large group.



Take back to school task

1. Use *Activity Guide: Term 3* to plan and implement Term 3 Weeks 7–10 of the Maths Programme.
2. Make notes of what worked well, what did not work well and how you resolved any challenges during your implementation of Term 3 Weeks 7–10.
3. Write comments in the book that you use to keep track of each learner's progress (learner observation book). Use the '**Check that learners are able to**' observation list (eye box) during each of the teacher-guided activities to guide your observations and comments.
4. Bring your learner observation book and the notes you made when reflecting on each day's teaching to the next workshop.
5. Bring a copy of Term 3: Exemplar Record of Continuous Assessments (from *Activity Guide: Term 3*) to the next workshop.

Evaluation

Complete the Evaluation Form.

APPENDIX A: TERM 3 WEEKLY PLANNING TEMPLATE

Term 3: Activity Plan: Week ____

CONTENT AREA:				
TOPIC:				
INTRODUCE NEW KNOWLEDGE:				
PRACTISE:				
Whole class activities		Teacher-guided activity	Workstation activities (independent small group activities)	
Day 1			Activity 1	
Day 2			Activity 2	
Day 3			Activity 3	
Day 4			Activity 4	
Day 5				

Term 3: Activity Plan: Week ____

CONTENT AREA:				
TOPIC:				
INTRODUCE NEW KNOWLEDGE:				
PRACTISE:				
Whole class activities		Teacher-guided activity	Workstation activities (independent small group activities)	
Day 1			Activity 1	
Day 2			Activity 2	
Day 3			Activity 3	
Day 4			Activity 4	
Day 5				

Term 3: Activity Plan: Week ____

CONTENT AREA:				
TOPIC:				
INTRODUCE NEW KNOWLEDGE:				
PRACTISE:				
Whole class activities		Teacher-guided activity	Workstation activities (independent small group activities)	
Day 1			Activity 1	
Day 2			Activity 2	
Day 3			Activity 3	
Day 4			Activity 4	
Day 5				

Term 3: Activity Plan: Week ____

CONTENT AREA:				
TOPIC:				
INTRODUCE NEW KNOWLEDGE:				
PRACTISE:				
Whole class activities		Teacher-guided activity	Workstation activities (independent small group activities)	
Day 1			Activity 1	
Day 2			Activity 2	
Day 3			Activity 3	
Day 4			Activity 4	
Day 5				

Workshop 9 Evaluation Form

1. Did the workshop meet your expectations?

2. What did you learn in this workshop that helped you the most?

3. Was there anything that you did not like or had difficulty understanding?

4. How will you apply what you have learnt in your Grade R classroom?

5. Do you have any suggestions for improving further workshops?
