English

Grade R Mathematics Improvement Programme

Workshop 4
Participant's Workbook

Contents

Overview

Purpose

This is the fourth 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 assist teachers to implement the Maths Programme in their classrooms. Participants will have the opportunity to reflect on their observations and explore how the **level principle** informs planning, teaching and learning. Participants will also consider the **level principle** and how to respond to learners with individual developmental and learning needs. The sessions will provide additional knowledge and understanding of teaching and learning in the Content Areas covered in Week 10 of Term 1, and Weeks 1–3 of Term 2.

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 1 Weeks 6–9
♦ To explore strategies to support teaching maths in Grade R
♦ To start to present solutions to learner progress and developmental levels
♦ To apply the Maths Programme principles in weekly planning
♦ To engage with the Maths Programme content of Term 1 Week 10 and Term 2 Weeks 1–3 (Data Handling; Numbers, Operations and Relationships; Space and Shape (Geometry))

Workshop content

♦ Opening and reflection	(1 hour)
♦ Session 1: Data Handling	(1 hour)
TEA	
♦ Session 2: Numbers, Operations and Relationships	(1 hour)
♦ Session 3: Space and Shape (Geometry)	(1 hour)
LUNCH	
♦ Session 4: Planning for teaching	(2 hours)

Opening and reflection

1 hour

Reflect on the implementation of the Maths Programme in your daily programme and complete the following activity in your group.

Activity 1

Discuss your progress in implementing the *Take back to school* task from Workshop 3.

Refer to the observation check boxes at the end of each week in *Activity Guide: Term 1,* Weeks 6, 7, 8 and 9.

1. What insights did you gain while observing learners during their Mathematics focus time?

    _____

    _____

2. What did you find difficult about the observation during the teacher-guided activity?

    _____

    _____

3. Mention one new thing that is working well with your implementation of Term 1 Weeks 6–9. Have you found that the Maths Programme is assisting with teaching and learning in your Grade R class?

    _____

    _____

According to the **level principle**, differentiation means that what you teach and how you teach it needs to take into account the different abilities or developmental levels of your learners. To use this approach, you need to continuously observe and record each learner's progress and development in maths.

Session 1: Data Handling

1 hour

This workshop focuses on teaching the following Maths Programme content: Term 1 Week 10 and Term 2 Weeks 1–3. This session focuses on Term 1 Week 10: Data Handling.

Term 1 Content overview: Data Handling

Refer to the Data Handling Content Area on page 68 of the *Concept Guide*.

Activity 2

In your group, discuss:

1. What Data Handling content is covered in Term 1?

_____
_____
_____

2. What does the Maths Programme add to the content from CAPS?

_____
_____
_____

Working with data

In this session, you will learn about the Data Handling cycle as a process for solving problems. Data Handling in Grade R focuses on collecting, sorting, organising, representing and analysing information about people or things. The main reason we collect data is to answer a question or to solve a problem.
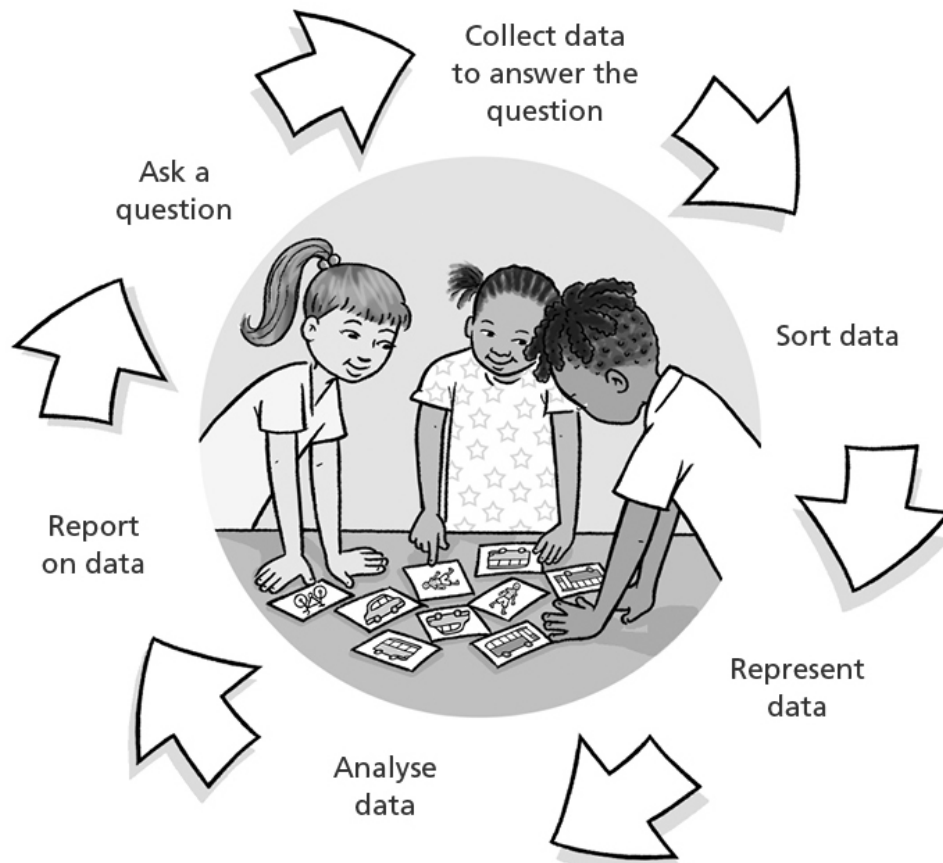
People often refer to the process of Data Handling as a cycle because the events or activities that are involved are repeated in the same sequence for each new question that is to be answered.

1. **Ask a question:** Learners decide what they want to find out about. This is the reason for collecting specific data or information.
2. **Collect data:** Learners decide they want to collect data based on the question or problem.
3. **Sort data:** Learners organise and sort data into groups according to the attribute. In order to answer questions and decide how to represent data that have been collected, decisions need to be made about how things could be sorted.
4. **Represent data:** Learners explore different ways of showing or displaying the information they have collected.
5. **Analyse data:** Learners describe and compare the data that is represented.
6. **Report on data:** Learners answer the question that was initially asked.

Objects can be sorted and classified (grouped) according to their similarities, such as colour, animals, plants. The more learners know about the properties of objects, and their similarities and differences, the more they are able to form different classification groups.

Video 1

Watch the video of the class creating and analysing a pictograph to represent the weather.

Discuss how the teacher presents each of the steps in the lesson. Notice the types of questions she uses and how she reinforces the use of correct vocabulary.

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_____

This next activity will take you through the six stages of the Data Handling cycle.

Activity 3

Take the following animal counters from the Maths Programme *Resource Kit*: three ducks, two chickens and one horse.

1. Consider this question: Are there more ducks or more chickens in the group?
2. Sort and collect data: Organise your animals into groups and then discuss the following with a partner:
   ♦ Can you see if there are more ducks than chickens now?
   ♦ How can you check?
3. Represent data: Place animals of the same kind one above the other in a column starting at the bottom of the grid.
4. Analyse and report on data: Look at your columns and discuss with a partner:
   ♦ Are there more ducks or more chickens? How do you know?
   ♦ Which column has more animals?
   ♦ Which column has fewer animals?
   ♦ Are there the same number of any kind of animal?

Refer to pages 93–94 of *Activity Guide: Term 1* and discuss how this activity is introduced to learners. Refer to pages 106–109 of the *Concept Guide* to read more about Data Handling. Notice the appropriate questions and vocabulary related to the teaching and learning of Data Handling in Grade R.

9

Session 2: Numbers, Operations and Relationships **1 hour**

The focus of Term 2 Weeks 1 and 2 is Numbers, Operations and Relationships.

Term 2 Content overview: Numbers, Operations and Relationships

Activity 4

Refer to the Numbers, Operations and Relationships Content Area on pages 57–61 of the *Concept Guide*.

1. What concepts are covered in Term 2?

_____

_____

_____

2. What does the Maths Programme add to the content of CAPS?

_____

_____

_____

Activity Guide: Term 2

Activity Guide: Term 2 provides teachers with weekly suggestions for teaching and learning Mathematics.

Look at the Contents page and pages 4–9 of *Activity Guide: Term 2*. You will see that the 'Introduction' in Term 2 is the same as in Term 1.

In Activity 4 you identified the number concepts to be covered in Term 2. In Activity 5 you will make links between these concepts and the New knowledge for the first two weeks of *Activity Guide: Term 2*.

👥 Activity 5

Refer to 'Content overview: Term 2' (*Activity Guide: Term 2*, pages 10–11).

1. What new knowledge is introduced to learners in the Numbers, Operations and Relationships Content Area?

    _____

    _____

2. Go back to Activity 4 and highlight or circle the concepts covered.

Understanding numbers

In Term 1, the numbers 1, 2 and 3 were taught. You used the same routine for each number taught, adding one more to the number each time a new number was introduced. In Term 2 Week 1, the focus is on the concept of number again. Learners are introduced to the number 4, using the same routine as for numbers 1, 2 and 3.

👥 Activity 6

Refer to the whole class activities that focus on number 4 in Week 1: *Activity Guide: Term 2*: page 13 (Day 1 #4), page 14 (Day 2 #5), page 15 (Day 3 #4), page 16 (Day 4 #4 and Day 5 #4).

1. Discuss how the number '4' is introduced.

    _____

    _____

2. Think about your own classroom practice and how this routine has been working so far. Complete the table.

Activity	What worked well?	What did not work so well?
Telling the story and building up the number frieze		
Dramatising the story		
Collecting objects for the maths area		
Matching objects to pictures, dot cards, number symbols and number words		
Using the *Poster Book*		

Maths vocabulary

Part of learning new concepts involves new language. Learners need the vocabulary to talk and think about maths concepts (**interaction principle**). You can encourage learners to use maths vocabulary by using it yourself when you speak to them about maths concepts and by rephrasing what they say into maths language.

Money

In Term 2 Week 2 learners are introduced to money. Learners in Grade R are developing an awareness about the features of money and they need opportunities to explore what real South African coins look like.

Activity 7 focuses on helping learners to recognise the similarities and differences between coins: their size, shape and the animals on the coins.

Activity 7

1. What questions could you ask learners to help them recognise the different features of these coins?

_____
_____
_____

2. What new vocabulary will you introduce?

_____
_____
_____

Learners first need to be able to identify and name coins before they are ready to understand their value.

Learners need to be exposed to the purpose of money. Teachers can help learners understand that money is used to buy things like food and clothes and to do different things like travelling by taxi or bus. Expose learners to money and its purpose by setting up a play-shop with pretend coins and notes and items that can be bought.

Refer to the whole class activities and small group activities that focus on money on pages 21–26 of *Activity Guide: Term 2*. In your group, complete Activity 8.

Activity 8

1. What money concepts are being taught and learnt in the whole class activities?

_____

_____

_____

2. How are learners encouraged to explore the purpose of money?

_____

_____

_____

3. How does the teacher consolidate this new knowledge in the small group activities?

_____

_____

_____

Session 3: Space and Shape (Geometry)   **1 hour**

The focus of Term 2 Week 3 is Space and Shape (Geometry).

Term 2 Content overview: Space and Shape (Geometry)
Refer to pages 63–65 of the *Concept Guide*.

Activity 9

1. What Space and Shape (Geometry) concepts are covered in Term 2?

_____

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_____

2. What does the Maths Programme add to the content of CAPS?

_____

_____

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Triangles
In Term 2 Week 3, learners continue their exploration of two-dimensional shapes as they describe, sort and compare them. In this session you will deepen your understanding of the properties of triangles.

Refer to Day 2 #4 on page 30 of *Activity Guide: Term 2* and then complete Activity 10 in your group.

Activity 10

'How is the triangle different to other shapes in the classroom?' What answers would you expect from your learners?

_____

_____

When learners are given opportunities to sort and group different shapes, they need to focus on the properties of the shapes to make their decisions, e.g. the number of sides, whether the sides are straight or curved and the number of corners.

Stories are a great way to introduce shape concepts to learners. Listen to the story, *They pulled and they pulled,* from Week 3 (*Activity Guide: Term 2,* pages 32 and 100) as told by your facilitator and then complete Activity 11 in your group.

Activity 11

1. What questions could you ask learners to help them learn more about the properties of triangles?

    _____

    _____

    _____

2. Are most of these questions open-ended or closed questions?

    _____

Note: Use *Activity Guide: Term 1* and *Term 2* to help you plan for teaching these weeks. The ideas and activity suggestions are a guide and resource. Set up the maths area with the content focus for each week.

Session 4: Planning for teaching   2 hours

📹 **Video 2**

Watch the video of the teacher-guided activity. Observe how the teacher uses questions to prompt and guide the learners during the activity.

Discuss how you have managed your teacher-guided activities in Term 1.
Have you faced any challenges? If so, what strategies have you used to resolve them?

_____

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_____

_____

Terms 1 and 2 Content Summary (Term 1 (Week 10) and Term 2 (Weeks 1–3))

Appendix A: Term 1 and 2 Weekly Content Summary: Term 1 (Week 10) and Term 2 (Weeks 1–3) outlines the main Content Area Focus for each week, the topics to be covered, the new knowledge and practise focus for each week, and suggested activities for whole class, teacher-guided and independent group work for the week.

👥 **Activity 12**

Look at Appendix A: Term 1 and 2 Weekly Content Summary: Term 1 (Week 10) and Term 2 (Weeks 1–3). Answer the questions.

Questions	Week 10 Term 1	Week 1 Term 2	Week 2 Term 2	Week 3 Term 2
What is the Content Area Focus for the week?				
What are the key concepts that learners will be learning?				
What new knowledge is introduced?				
What skills are being practised?				

Activity Guide: Term 1: Week 10 and Activity Guide: Term 2: Weeks 1–3

Refer to Week 10 in *Activity Guide: Term 1* and Weeks 1, 2 and 3 in *Activity Guide: Term 2*. Complete Activity 13 in your group.

Activity 13

Find Week 10 in *Activity Guide: Term 1*. Answer the questions.
1. What is the Content Area Focus for the week?
2. What topics and new knowledge are taught in this week?
3. How does the 'Practise' content link to the previous week?
4. What do you need to get ready before teaching this week?
5. Read the whole class activities and small group activities.
6. Discuss in your small group how you will plan and organise your class for this week of teaching.
7. In your small group refer back to Week 10 in Appendix A. Match the whole class activities and small group activities in Week 10 of *Activity Guide: Term 1* to the Weekly Content Summary in Appendix A.

Activity 14

Find Weeks 1, 2 and 3 in *Activity Guide: Term 2*. Answer the questions.
1. What is the Content Area Focus for each week?
2. What topics and new knowledge are taught in each week?
3. How does the 'Practise' content link to the previous week?
4. What do you need to get ready before teaching each week?
5. Read the whole class activities and small group activities.
6. Discuss in your small group how you will plan and organise your class for these three weeks of teaching.
7. In your small group refer back to Weeks 1–3 in Appendix A. Match the whole class activities and small group activities in Weeks 1–3 of *Activity Guide: Term 2* to the Weekly Content Summary in Appendix A.

Remember that the eye in the shaded block at the end of the teacher-guided activities (**Check that learners are able to)** reminds us that we need to observe the learners while they are busy, and we need to listen carefully while they are talking to us and to their peers.

Make a mental note of each learner and once the learners have left for the day, write down your observations in a dedicated observation book that has space for each learner's notes.

Closing activities

Activity 15

Lessons learnt: Think about what you learnt during the workshop and complete the table.

Things I am already doing that work well	New ideas that I would like to try

Take back to school task

1. Continue with your observations to build up a complete picture of each learner.
2. During the teacher-guided activities complete the *Check that learners are able to* section (after the teacher-guided activity in each week) for each learner being observed.
3. Make a copy of the Exemplar Record of Continuous Assessments in *Activity Guide: Term 1* (pages 96–97).

4. Use the information collected in your observation notes to date and record each learner's development. (Remember that patterns of development need to be recorded over time.)
5. Use *Activity Guide: Term 1* (Week 10) and *Activity Guide: Term 2* (Weeks 1–3) to plan and implement Term 1 Week 10 and Term 2 Weeks 1–3 of the Maths Programme, including creating a maths area with a focus on the concept for each week.
6. Write an evaluation of what worked well, what did not work so well and what you could do differently to improve teaching and learning. Bring your evaluation report to the next workshop.

Evaluation
Complete the Evaluation Form.

APPENDIX A: TERM 1 AND 2 WEEKLY CONTENT SUMMARY: TERM 1 (WEEK 10) AND TERM 2 (WEEKS 1–3)

Term 1: Activity Plan

Week 10				
CONTENT AREA: DATA HANDLING				
TOPIC: Collect and sort objects, represent sorted collections of objects, discuss and report on sorted collections of objects **INTRODUCE NEW KNOWLEDGE:** Collect, sort and represent collections of objects (weather); discuss and report on sorted collections; create own pattern **PRACTISE:** Oral counting 1–10, counting backwards from 5, sequencing numbers 1–3, counting objects 1–5, number concept 1–3, copy patterns, problem-solving techniques				
Whole class activities		**Teacher-guided activity**	**Workstation activities**	
Day 1	Sorting and classifying, waste items.	Oral counting. Touch and count – one-to-one correspondence. Sorting and classifying activities – animals. Representing and interpreting data.	**Activity 1**	Sorting waste.
Day 2	Data collection, sorting clothing items.		**Activity 2**	Sorting colours.
Day 3	Sorting and classifying, group game.		**Activity 3**	Sorting tray, natural items.
Day 4	Use data collected from the weather discussions, represent and analyse how many days were sunny, raining etc.		**Activity 4**	Copy pattern using concrete objects and then create own pattern.
Day 5	Weather data collection, representing and analysing.			

Term 2: Activity Plan

Week 1				
CONTENT AREA: NUMBERS, OPERATIONS AND RELATIONSHIPS				
TOPIC: Recognise number symbols and number words, describe, order and compare numbers **INTRODUCE NEW KNOWLEDGE:** More than/fewer than/equal to, introduce number 4 **PRACTISE:** Oral counting 1–10, sequencing numbers 1–3, counting objects 1–5, reinforce number concept 1–3				
Whole class activities		**Teacher-guided activity**	**Workstation activities**	
Day 1	Introduce 4 (giraffes).	Counting objects 1–5. Matching objects to number dot, symbol and word cards 1–4. Arrange counters to match dot cards. Practise more than, fewer than, equal. Write number 4 (as with numbers 1 to 3).	**Activity 1**	Playdough mat 4 (as for previous numbers).
Day 2	Introduce more than/less than/equal to, maths table.		**Activity 2**	Number ordering puzzle activity to 4 (forms a picture).
Day 3	Reinforce 1–4, dot cards and ordering.		**Activity 3**	Matching number symbols, words and concrete objects to 4.
Day 4	Reinforce 1–4, Unifix blocks and hoops.		**Activity 4**	Number puzzles (no number words).
Day 5	Reinforce number 4, Poster 6.			

Week 2

CONTENT AREA: NUMBERS, OPERATIONS AND RELATIONSHIPS

TOPIC: Money: develop an awareness of South African coins
INTRODUCE NEW KNOWLEDGE: South African coins, ordinal numbers first to fourth, making equal groups the same to 4, counting objects 1–6
PRACTISE: Oral counting 1–10 and 5–1, sequencing numbers 1–4, reinforce number concept 1–4, biggest to smallest/smallest to biggest

Whole class activities		Teacher-guided activity	Workstation activities	
Day 1	Introduce South African coins (cents and rands), Poster 7.	Number concept 1–4. Estimation. Shake and break with 4. South African coins – match coins to 'goods in shop'. Use cut-out coins; sorting, ordering, matching. Make equal groups to 4 – using counters.	**Activity 1**	Make own coin (give a circle shape).
Day 2	Maths table – shopping, ordinal numbers first to fourth.		**Activity 2**	Number caterpillar – sequencing numbers 1–4.
			Activity 3	Draw or paste objects to match numbers 1–4.
Day 3	Matching number/dot cards and number words.		**Activity 4**	Posting activity using number and colour 1–4.
Day 4	Ordering number 1–4, shopping.			
Day 5	Problem solving up to 4 (Poster 7).			

Week 3

CONTENT AREA: SPACE AND SHAPE (GEOMETRY)

TOPIC: Position, orientation and views; describes sorts and compares 2-D shapes
INTRODUCE NEW KNOWLEDGE: Position: underneath, oral counting 1–15, counting objects 1–7, orientation and views
PRACTISE: Oral counting 1–10 and 5–1; sequencing numbers 1–4; reinforce number concept 1–4; count backwards 5–1; shapes: circle, square, triangle; position: in front of, behind, on top, between, next to; direction: forwards, backwards

Whole class activities		Teacher-guided activity	Workstation activities	
Day 1	Positions, shape game.	Counting. Use shapes to show correct number (1–4). Position: next to, between, in front of, behind, on top, underneath. Direction: forwards, backwards.	**Activity 1**	Colour triangles.
Day 2	Reinforce the triangle.		**Activity 2**	Carrot activity (cut out triangles and add correct number of leaves).
Day 3	Position (next to, between, in front of, behind, on top, underneath).		**Activity 3**	Sorting tray – according to colour, shape **or** size (one attribute).
Day 4	Reinforce all the shapes done, shape story.		**Activity 4**	Building towers with construction blocks.
Day 5	Following direction: How do I get to …? Poster 9. Orientation and views using a toy car.			

Workshop 4 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?

_____
_____
_____
_____