GAUTENG PROVINCE
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English

Grade R Mathematics Improvement Programme

Workshop 6
Participant's Workbook

The Grade R Mathematics and Language Improvement Project is an initiative of the **Gauteng Department of Education** and its key partner, the **Gauteng Education Development Trust**.

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The Grade R Mathematics and Language Improvement Project is managed by **JET Education Services** with **UCT's Schools Development Unit** and **Wordworks** as technical partners.

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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- The R-Maths writing team: SDU staff and consultants.
-

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Overview

Purpose

This is the sixth 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 with the implementation of the Maths Programme in their classrooms, especially the Content Areas covered in Term 2 Weeks 8–10. Participants will reflect on their ongoing assessment of learners' progress and will document developmental concerns related to the learners that may require special interventions and support. Participants will also reflect on teaching strategies that strengthen learners' problem-solving skills.

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 2 Weeks 4–7
- To explore strategies to support teaching maths in Grade R
- To reflect on the Maths Programme's principles in the weekly plan
- To engage with the Maths Programme content of Term 2 Weeks 8–10 (Space and Shape (Geometry); Measurement; Numbers, Operations and Relationships)
- To apply knowledge of informal, continuous assessment to learning and teaching

Workshop content

- Opening and reflection (1 hour)
- Session 1: Space and Shape (Geometry) (1 hour)

TEA

- Session 2: Measurement (1 hour)
- Session 3: Numbers, Operations and Relationships (1 hour)

LUNCH

- Session 4: Numbers, Operations and Relationships (45 minutes)
- Session 5: Term 2 Assessment (1 hour)
- Closing activities (15 minutes)

Opening and reflection **1 hour**

Here is the *Take back to school* task from Workshop 5.

Take back to school task (Workshop 5)

1. Continue to use the Record of Continuous Assessments in *Activity Guide: Term 2* to assess your learners. Make use of your ongoing observation notes to build up evidence of what learners understand and can do.
2. Identify any concerns you have about individual learner's emerging grasp of maths concepts.
3. Bring copies of rubrics that you used for maths assessment to the next workshop.
4. Bring a completed assessment record for one learner to the next workshop.
5. Use *Activity Guide: Term 2* to plan and implement Weeks 4–7 of the Maths Programme, including creating a maths area with a focus on the concept for each week.
6. Make notes on what worked well, what did not work so well and what you could do differently to improve teaching and learning.

Activity 1

1. In your groups, discuss your progress in implementing Term 2 Weeks 4–7.
   - What worked well (strengths)?
   - What did not work well (challenges)?
   - What could you do to improve teaching and learning in your classroom?

Record the main points of your discussion on flipchart paper to share with the other groups later.

_____

_____

2. Discuss how successful you were in:
   - recording notes about individual learners after each teacher-guided activity in Weeks 4–7.
   - completing the Term 2: Record of Continuous Assessments on pages 96–97 of *Activity Guide: Term 2* for each learner.

Record the main points of your discussion on your flipchart paper.

_____

_____

3. Discuss one learner's areas of success and/or difficulty and how you recorded these. Record the main points of your discussion on your flipchart paper.

_____

_____

In the *Take back to school* task in Workshop 5 you were asked to bring copies of the learner assessment rubrics you use as part of the Maths Programme to this workshop. In Activity 2, your group will discuss these rubrics and how assessment information is captured and shared. In Session 5, we will discuss rubrics in more detail.

Activity 2

1. In your groups, share examples of maths rubrics you have used as part of your assessment process.
2. Discuss how you capture the learners' progress on the SA-SAMS system and how this information is shared with parents.

Record the main points of your discussion on flipchart paper to share with the other groups later.

_____

_____

Video 1

Watch the video of a teacher observing a group of learners completing a maths activity. Listen to her talking about how she observes and records her learners' progress and how she deals with their different levels of competence.

Discuss how you deal with learners who are not achieving success in the structured weekly plans, as well as those learners who exceed expectations.

_____
_____
_____

The **level principle:** Not all learners progress at the same speed. Some learners need more time to consolidate a skill or concept while others grasp ideas more quickly. The challenge for teachers is to accommodate learners at different levels and to adapt the weekly plan to provide support or extension activities where necessary.

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

This workshop focuses on teaching the content of Term 2 Weeks 8–10. The focus of Term 2 Week 8 is Space and Shape (Geometry).

Terms 1–4 Content overview: Space and Shape (Geometry)

Refer to the content overview for Space and Shape (Geometry) on pages 63–65 of the *Concept Guide* and complete Activity 3.

 **Activity 3**

1. What Space and Shape content has already been introduced in Terms 1 and 2?

_____
_____
_____

2. What concepts still need to be covered in Term 2?

_____
_____
_____

Properties of shapes

Learners need many opportunities to compare and sort shapes according to their properties and to describe the similarities and differences of shapes.

 **Activity 4**

The facilitator will give your group a set of shapes.

1. Sort the shapes.
2. Discuss why you sorted them in this way.
3. Sort the shapes in another way.
4. Discuss why you sorted them in this way.

Term 2 Content Summary: Week 8

Refer to Appendix A: Term 2 Weekly Content Summary (Weeks 8–10). Read the content overview for Week 8: Space and Shape (Geometry) on page 11 of *Activity Guide: Term 2*.

The Space and Shape (Geometry) Content Area was also the focus of Term 2 Weeks 3 and 4. In previous workshops, you have discussed the Space and Shape concepts that need to be covered.

The Weekly Content Summary for Week 8 provides an overview of planning for the week: whole class activities, teacher-guided activities and workstation activities done in independent small groups.

 **Activity 5**

1. Take a few minutes to familiarise yourself with the Week 8 content in Appendix A: Term 2 Weekly Content Summary (Weeks 8–10).
2. Match this with the content on pages 70–77 of *Activity Guide: Term 2*. Identify how the whole class, teacher-guided and workstation activities link with the Week 8 content in Appendix A.

Session 2: Measurement **1 hour**

The focus of Term 2 Week 9 is Measurement.

Terms 1–4 Content overview: Measurement

Refer to the content overview for Measurement on pages 66–67 of the *Concept Guide*.

 **Activity 6**

1. What Measurement concepts are covered in Term 2?

_____

_____

_____

2. What are the differences between the Maths Programme content and the CAPS content?

_____

_____

_____

Directly comparing objects: length

In Term 1 of the Maths Programme the focus of the Measurement Content Area was time (day, night, days of the week, sequencing events, etc.) and the height chart. In Term 2 Week 9, the focus is on using non-standard units to measure and compare length.

 **Activity 7**

1. **Direct comparison**
   Choose a partner to stand next to. The rest of your group members should compare your heights.
   - Who is taller? _____
   - Who is shorter? _____
   - Find a third person who is taller than both of these people.

2. **Using non-standard units of measurement**
   Choose three objects (e.g. a key, a cellphone, a purse).
   - Use one of these items at a time to measure this *Participant's Workbook*.
   - Report your findings to the group.

_____

_____

_____

Term 2 Content Summary: Week 9

Refer to Appendix A: Term 2 Weekly Content Summary (Weeks 8–10). Read the content overview for Week 9: Measurement on page 11 of *Activity Guide: Term 2*.

Read the whole class activities for Week 9 on pages 78–83 of *Activity Guide: Term 2*.

 **Activity 8**

In your groups, discuss how length is taught during the whole class activities in Week 9.

1. What could you do if a learner is not yet able to compare and order objects according to length – long/longer and short/shorter by the end of Week 9?

_____
_____
_____

2. What could you do if some learners complete a workstation activity successfully quicker than planned?

_____
_____
_____

Session 3: Numbers, Operations and Relationships

1 hour

The focus of Term 2 Week 10 is Numbers, Operations and Relationships.

Terms 1–4 Content overview: Numbers, Operations and Relationships

The Numbers, Operations and Relationships Content Area was also the focus in Weeks 1, 2 and 5 of Term 2, and you discussed the number concepts that need to be covered in previous workshops. Look at the content overview for Numbers, Operations and Relationships on pages 57–61 of the *Concept Guide*.

 **Activity 10**

What number concepts still need to be covered in Term 2?

_____

_____

Problem solving

Teachers need to provide learners with many opportunities to solve problems so that they can apply their maths knowledge and skills in new contexts. All games and activities involve problem solving. Word problems in maths introduce a specific type of problem solving that involves solving addition, subtraction, multiplication and division problems. In Grade R learners solve addition and subtraction problems by counting and using concrete apparatus to help them find a solution. They use grouping and one-to-one sharing to solve multiplication and division problems.

The biggest challenge in presenting word problems to learners, is to ensure that there is appropriate questioning and use of language. When teachers present a word problem, they need to listen carefully to learners' responses and guide them to solve the problem using a strategy that is suitable for their level of understanding.

The posters in the *Poster Book* have been designed to provide learners with a set of pictures that relate to their lives and provide contexts for solving real-life problems.

In Week 10 Day 4 (page 91 of *Activity Guide: Term 2*), Poster 1 is used to encourage learners to solve problems that involve numbers 1–5.

 **Activity 11**

In your groups, refer to Poster 1. Think of appropriate word problems for each of these skills:

- comparing
- matching
- counting
- addition
- subtraction
- grouping
- equal sharing.

_____
_____
_____
_____
_____

When you do word-problem activities with your learners, allow them to use their fingers or counters to help them solve the problems.

One of the sections in Numbers, Operations and Relationships is, 'Solve problems in context'. In your groups, read the content overview for Term 2 for this section on page 60 of the *Concept Guide*. Then complete Activity 12.

 **Activity 12**

Reflect on Activity 11.

1. What concepts and skills are taught and learnt in the topic: Problem-solving techniques?

_____
_____

2. What concepts and skills are taught and learnt in topic: Addition and subtraction?

_____
_____

Estimation

Learners develop estimation skills and make a 'sensible' guess about 'how many objects' there are in a collection. During measurement activities, they estimate how heavy or how long something is, or how many cups will fill a jug before they do the actual measuring.

 **Activity 13**

The facilitator will show you two jars. Estimate how many objects are in each jar and respond to her questions.

_____

_____

Learners need to be able to use terms such as: *too few, too many, more than, enough, not enough, nearly, close to, about the same, just under, just over*.

Teachers can plan estimation activities that encourage learners to make sensible guesses about the quantity of a group of objects or the measurement of an object.

Term 2 Content Summary: Week 10

Refer to Appendix A: Term 2 Weekly Content Summary (Weeks 8–10). Read the content overview for Week 10: Numbers, Operations and Relationships on page 11 of *Activity Guide: Term 2*.

 **Activity 14**

1. What are the topics for Week 10?

_____

_____

2. What new knowledge is introduced in this week?

_____

_____

_____

3. What skills from previous weeks are practised?

_____

_____

_____

Refer to the estimation activities in Week 10 (*Activity Guide: Term 2*, pages 88 (Day 1), 89 (Day 2) and 90 (Day 3)).

Session 4: Numbers, Operations and Relationships

45 minutes

The Maths Programme focuses on one main Content Area each week. You will have noticed that even though when the weekly Content Area Focus is not 'number', the number routines continue every day of each week. The reason for this is that repetition and practice are essential for consolidating the learners' developing number skills.

The whole class activities for each day of the week always start with three number routines:

- a song or rhyme
- oral counting
- counting objects.

These three number routines are planned to match the number range for each term.

 **Activity 15**

Find the Term 2 daily number routines in *Activity Guide: Term 2* and complete the table. Week 1 has been done for you.

Week	Content Area Focus	Song or rhyme	Oral counting	Counting objects
1	Numbers, Operations and Relationships	A rhyme from Term 1	1–10 5–1	1–5 (birthday chart)
2				
3				

4				
5				
6				
7				
8				
9				
10				

Having looked through the number content for Term 2, you will have noticed that the number routines are practised every day of each week regardless of the Content Area Focus and that the progression in number range increases across the term.

Session 5: Term 2 Assessment **1 hour**

 **Video 2**

Watch the video of a teacher presenting word problems to a small group of learners.

Observe how each learner solves the problem. Notice how the teacher uses prompts when a learner has difficulty.

 **Activity 16**

Look at the rubric on page 53 of the *Concept Guide*.

In your groups, discuss how you would score each of the learners using this scale. Give reasons for your decisions based on the assessment criteria for each rating code.

_____

_____

_____

Closing activities

15 minutes

 **Activity 17**

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 any questions or comments to share with the group.

_____
_____
_____

 **Take back to school task**

1. Use *Activity Guide: Term 2* to plan and implement Weeks 8–10 of the Maths Programme.
2. Write an evaluation of what worked well, what did not work so well and what you could do differently to improve teaching and learning.
3. Bring your evaluation to the next workshop.

Evaluation

Complete the Evaluation Form.

APPENDIX A: TERM 2 WEEKLY CONTENT SUMMARY (WEEKS 8–10)

Term 2: Activity Plan

<table>
<tr><th colspan="5">Week 8</th></tr>
<tr><td colspan="5">CONTENT AREA: SPACE AND SHAPE (GEOMETRY)</td></tr>
<tr><td colspan="5">TOPIC: Properties of shapes – compare same and different, sort according to properties; position; orientation and views
INTRODUCE NEW KNOWLEDGE: Follow direction and midline crossing
PRACTISE: Oral counting 1–20, counting backwards from 7, sequencing numbers 1–5, counting objects 1–7, reinforce number concept 1–5, what number comes before/after, practise using all shapes</td></tr>
<tr><th colspan="2">Whole class activities</th><th>Teacher-guided activity</th><th colspan="2">Workstation activities</th></tr>
<tr><td>Day 1</td><td>Forwards/backwards.</td><td rowspan="5">Counting – show me 1–3, 5–7 counters.
Working with all taught shapes.
Midline crossing. Position – direction.
Forwards/backwards.</td><td>Activity 1</td><td>Sorting activity – using cut-out shapes.</td></tr>
<tr><td>Day 2</td><td>Reinforce all shapes (I spy …).</td><td>Activity 2</td><td>Make shapes using playdough and make a copy.</td></tr>
<tr><td>Day 3</td><td>Shape game.</td><td>Activity 3</td><td>Masking tape shapes – learners follow shapes using blocks.</td></tr>
<tr><td>Day 4</td><td>What can I do: Lost my … (shape).</td><td>Activity 4</td><td>Match shapes using shape cards.</td></tr>
<tr><td>Day 5</td><td>Obstacle course (requires a big space/outdoors). Midline crossing.</td><td></td><td></td></tr>
<tr><th colspan="5">Week 9</th></tr>
<tr><td colspan="5">CONTENT AREA: MEASUREMENT</td></tr>
<tr><td colspan="5">TOPIC: Length – compare and order objects using appropriate vocabulary to describe length
INTRODUCE NEW KNOWLEDGE: Measuring and comparing length (long/short, longer/shorter, longest/shortest)
PRACTISE: Oral counting 1–20, counting backwards from 7, counting objects 1–7, estimation 1–7, tall/short</td></tr>
<tr><th colspan="2">Whole class activities</th><th>Teacher-guided activity</th><th colspan="2">Workstation activities</th></tr>
<tr><td>Day 1</td><td>Longer/shorter (height).</td><td rowspan="5">Longer than/shorter than.
Taller than/shorter than.
Measurement with everyday objects.</td><td>Activity 1</td><td>Shorter/longer (pre-cut strips of different length).</td></tr>
<tr><td>Day 2</td><td>Comparing lengths of ribbons.</td><td>Activity 2</td><td>Wiggly worms (to make a poster shortest to longest).</td></tr>
<tr><td>Day 3</td><td>Sorting objects by length (coloured paper strips).</td><td>Activity 3</td><td>Measure blocks using string.</td></tr>
<tr><td>Day 4</td><td>Height chart comparison (from Term 1).</td><td>Activity 4</td><td>Playdough and lined paper (different lengths).</td></tr>
<tr><td>Day 5</td><td>Height chart comparison (taller/shorter than you).</td><td></td><td></td></tr>
</table>

<table>
<tr><th colspan="5">Week 10</th></tr>
<tr><td colspan="5">CONTENT AREA: NUMBERS, OPERATIONS AND RELATIONSHIPS</td></tr>
<tr><td colspan="5">TOPIC: Describe, compare and order numbers; addition and subtraction (oral); problem solving
INTRODUCE NEW KNOWLEDGE: Breaking down and building up numbers, problem-solving techniques, addition and subtraction using concrete objects, numbers in familiar settings (address and phone number)
PRACTISE: Oral counting 1–20, counting backwards from 7, sequencing numbers 1–5, counting objects 1–7, reinforce number concept 1–5, what number comes before/after</td></tr>
<tr><th colspan="2">Whole class activities</th><th>Teacher-guided activity</th><th colspan="2">Workstation activities</th></tr>
<tr><td>Day 1</td><td>Ordering, using numbers 1–5. Dot cards.</td><td rowspan="5">Ordering numbers and dot cards (1–5).
Fewer/more/less than.
Decomposition of numbers.
Phone numbers and addresses.</td><td>Activity 1</td><td>Write numbers 1–5 and draw dots using white board markers and plastic sheets. Count sticks to match.</td></tr>
<tr><td>Day 2</td><td>Addition using concrete objects. Musical chairs.</td><td>Activity 2</td><td>Tracing shapes according to given number.</td></tr>
<tr><td>Day 3</td><td>Subtraction using concrete objects.</td><td>Activity 3</td><td>Feely cups with number of objects – feel amount and show number symbol.</td></tr>
<tr><td>Day 4</td><td>Problem solving. Poster 1.</td><td>Activity 4</td><td>Number matching pictures.</td></tr>
<tr><td>Day 5</td><td>Memory game: Address and phone number. Game: Making groups of 1–5 learners.</td><td></td><td></td></tr>
</table>

Workshop 6 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?

_____
_____
_____
_____