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Grade R Mathematics Improvement Programme

Workshop 10 Facilitator's Guide

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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Programme conceptualisation and management: Cally Kuhne and Tholisa Matheza
Translation and publishing project management: Arabella Koopman

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Overview

Purpose

This is the tenth 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 4 Weeks 1–3 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 7–10
- To reflect on the use of the guiding principles of teaching maths in Grade R
- To deepen understanding of continuous learner observation in Grade R
- To reflect on informal forms of 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 4 Weeks 1–3

Workshop content

- Opening and reflection (1 hour)
- Session 1: Observation and assessment (1 hour)

TEA

- Session 2: The guiding principles of teaching maths in Grade R (1 hour)
- Session 3: Introducing numbers 10 and 0 (1 hour)

LUNCH

- Session 4: Planning for teaching (1½ hours)
- Closing activities (30 minutes)

Preparation

- PPT welcome and outcomes
- Familiarise yourself with all the PowerPoints and videos
- Read:
  Concept Guide, pages 7–36
  Activity Guide: Term 4, pages 12–35
- Bring the post box
- Remind participants to bring their:
  Concept Guide
  Activity Guide: Term 3
  Activity Guide: Term 4
  Poster Book
- Cut out the eight pictures of the guiding principles (Appendix B)
- Prepare one set of the number cards in Appendix C for each group

Materials

- Flipchart paper, kokis
- Prestik
- A *Resource Kit* for each group

Opening and reflection **1 hour**

Reflection involves thinking and talking about your experiences and what you have learnt.

Reflection on implementation

Facilitator's notes

- PPT: Learning outcomes of the workshop.
- Discuss the post box comments and feedback from the previous workshop. Remind participants to 'post' any new comments and feedback during the workshop.
- Remind participants of the *Take back to school* task from the end of Workshop 9.
- Refer participants to **Activity 1** and read through the instructions aloud.
- Give each group a sheet of flipchart paper. Participants complete the activity in their groups. Groups then present their newspaper article.
- After the presentations, summarise the successes and challenges and discuss the implications for classroom implementation.

Here is the *Take back to school* task from Workshop 9.

Take back to school task (Workshop 9)

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 the Term 3: Exemplar Record of Continuous Assessments (from *Activity Guide: Term 3*) to the next workshop.

Activity 1

1. In your group, prepare a newspaper article on teaching and learning maths in Grade R. Use the Maths Programme and your classroom implementation of it as the basis for your article. Include the following:

- why maths in Grade R is important
- your successes and challenges with implementing the Maths Programme in Terms 1, 2 and 3
- strategies you used to resolve challenges.

_____
_____
_____
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2. Write the newspaper article on flipchart paper.
3. You will present your article to the other groups and answer any of their questions.

Session 1: Observation and assessment **1 hour**

Observation in Grade R

Observation is an important part of the process of teaching, learning and assessment. In Grade R, the main assessment method is observation. Teachers gather information about learners during whole class activities, small group activities and free play (inside and outside the classroom). During the teacher-guided activities, your interaction with individual learners provides valuable information about their progress. By recording the learners' progress in understanding specific maths concepts in your notebook on an ongoing basis, you build up a complete picture of each learner.

Objective observation

For observation to be effective, teachers need to understand and know what to focus on.

In the next activity, you will practise your observation skills. *This is an individual activity. It is very important that you do not talk to anyone about your observations.*

Facilitator's notes

- PPT: Photo from **Activity 2**.
- Explain that in **Activity 2** participants will practise their observation skills.
- Read through **Activity 2** together and make sure everyone understands that it is an individual activity and not to be discussed with anyone.
- When everyone has finished the activity, give participants a turn to call out what they have written. Write down each observation (exactly as it is called out) and tick the observations that are repeated.
- Discuss the importance of being objective when observing. Make the point that teachers need to record facts (what is seen and heard) and not assumptions or opinions (what they think may be happening and why).
- Read through the list of observations that participants called out and discuss whether each statement is a FACT or an ASSUMPTION. Write 'F' or 'A' next to each statement. For example:
  - The learner has built a construction using rectangle-shaped and triangle-shaped blocks. **F**
  - The learner is not managing to balance the triangle-shaped blocks. **A**
  - The learner is focused on the block-building task. **F**
  - The learner in the background is very happy. **A**
- Participants go through their own lists, marking each statement with an 'F' or an 'A'.
- Wrap up the activity with a discussion about the importance of objective observation.

 **Activity 2**

Look at the photograph of two Grade R learners playing with blocks. Write down what you observe when you look at the photograph.

My observations:

_____

_____

_____

_____

Facilitator's notes
♦ After watching **Video 1**, add participants' observations to the list you recorded in **Activity 2**. ♦ Remind participants of the difference between a FACT and an ASSUMPTION. Write 'F' or 'A' next to each statement.

Video 1

Activity Guide: Term 3, Week 8, Workstation 3: Bingo game (page 76)

1. Watch the video of a group of learners playing the game, Bingo. Write down your observations of the learners.

_____

_____

_____

_____

_____

_____

_____

_____

2. Which of your observations are facts and which are assumptions? Go through your list and write an 'F' or 'A' next to each statement.

When we write what we **think** a learner can or cannot do, or what a learner is feeling, we are making assumptions. The only way to know what a learner is thinking or feeling, is to ask them to tell you.

Objective observation involves:

- describing only what you see and hear
- recording what the learner is doing and saying in as much detail as possible
- not judging – avoid giving your own ideas and opinions
- observing each learner regularly, in different activities and at different times of the day.

Activity 3

1. Think about your observations of *one* of your learners in Term 3. What mathematical knowledge and skills is this learner developing?

_____
_____
_____
_____

2. Refer to (3) to (5) of the *Take back to school* task from Workshop 9 (page 6).
   - Discuss your use of the **'Check that learners are able to'** observation list (eye box) during teacher-guided activities.
   - Show members of your group your learner observation book.
   - Take turns to discuss a learner's progress. Which mathematical skills did you observe? How do you know? (What did the learner do and say?)
   - Explain how you captured this information using the Term 3: Exemplar Record of Continuous Assessments.
   - Did you manage to implement a differentiated approach to teaching and learning in your class. If so, how?

_____
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Assessment in Grade R

Assessment in Grade R is used to make decisions about the best way to support each learner's development. During teacher-guided activities, whole class activities as well as other activities in the daily programme, you will have opportunities to observe learners and gain insight into their progress. This information should guide your planning for further teaching and learning.

The continuous assessment tables in CAPS and in the Maths Programme's *Activity Guides* are based on the content that has been taught each term and can be used to summarise each learner's progress during the term.

Note that skills and behaviours should be observed on several occasions so that patterns of development over time can be recorded.

Facilitator's notes

- Wrap up this session with a discussion about the importance of continuous observation and the regular recording of learner information as a basis for assessment.

Session 2: The guiding principles of teaching maths in Grade R

1 hour

Throughout the Maths Programme training, we have referred to the guiding principles of teaching maths in Grade R and how these are incorporated into daily classroom practice. Some of the principles are easier to identify and implement than others. As teachers we need to be constantly aware of how, where and when we are using these principles in our classrooms.

Facilitator's notes

- PPT: Figure 5, page 7, *Concept Guide*.
- Discuss the importance of being conscious of the guiding principles of teaching maths in Grade R and how these inform our approach to teaching. It is only when we are aware of these principles and reflect on how we incorporate them in our teaching that they become a part of how we approach our classroom practice.
- Divide the participants into eight small groups. Assign one guiding principle to each group. Give the corresponding picture of this principle (Appendix B) to each group.
- Participants discuss their principle in their small groups. They then present their understanding and observations of how their principle plays out in the classroom.
- The participants paste the A5 picture on flipchart paper and write their comments underneath it to share with the whole group.

Activity 4

The facilitator will assign one of the guiding principles of teaching maths in Grade R to your group. You will receive a picture of this principle.

1. In your group, discuss the following questions:
   - What is your understanding of this principle 'in action'?
   - Does the Maths Programme make it possible to incorporate this principle in your daily teaching?
   - Now that you have implemented the Maths Programme for three terms, what are your reflections on this principle?
   - How would your teaching be affected if this principle was absent from your classroom approach?

2. Paste the picture onto a sheet of flipchart paper. Write your comments below the picture so that you can share these with the whole group.

1. **The context principle.** Learning takes place in meaningful and appropriate situations.

8. **The practice principle.** Learning is consolidated through practising new skills and knowledge.

2. **The activity principle.** Learners should be directly involved in the learning–teaching process.

7. **The inclusivity principle.** Learning takes place in an environment where everyone is welcomed, included, treated fairly, respected and can participate.

THE EIGHT PRINCIPLES OF GRADE R MATHS

3. **The play principle.** Children learn best in free-play and guided-play activities.

6. **The guidance principle.** Learning takes place when teachers guide learners in developing new knowledge.

5. **The interaction principle.** Learning takes place when there is communication and sharing of ideas.

4. **The level principle.** Learners pass through various levels of understanding and development.

Session 3: Introducing numbers 10 and 0 **1 hour**

Introducing number 10

Facilitator's notes

- PPT: Summarise information below.
- Discuss the base 10 number system that we use. Emphasise that in Grade R learners only need to work with and understand the numbers 0–10. (**Activity 5** is for enrichment. It is not intended for use in Grade R classrooms.)
- When using expanding number cards (flashcards) like the ones in Appendix C to make two-digit and three-digit numbers, always use the units (ones), tens or hundreds. Never use only the units to represent a two-digit or three-digit number. For example: for 11 use 10 and 1, not 1 and 1.
- Explain that in Grade 1 learners begin to work with place value. They need to understand the value of each digit in the number. It is important that Grade R learners understand that 10 is a number and not just 1 + 0. Learners should make groups of ten. They should also use sticks to make bundles to represent ten and match the bundle with the 'ten' number word card.
- **Emphasise that teachers should not introduce place value in Grade R and that Activity 5 is an enrichment activity for workshop participants only**.

The ten numerals used in our place value number system are 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. These numerals are used to represent units (ones) and to represent an infinite number of values, for example:

- tens
- hundreds
- thousands, and so on.

Learners in the Foundation Phase need to understand that the same numeral can be used to represent different values, depending on the position of the numeral in a number. For example, in each of the numbers below '3' has a different value:

- in 3, its value is 'three'
- in 31, its value is 'thirty'
- in 349, its value is 'three hundred'.

Place value is a difficult concept for learners to understand. Researchers have found that many learners up to the age of eight think that the '1' in 15 means 'one'.

In Grade 1 learners explore the base ten number system, working with numbers from 11 onwards. They represent these numbers with groups of tens and single ones (units). When they work with numbers 11–19, they begin to understand that in a number like 14, the numeral 1:

- does not mean 1
- represents 10 ones
- therefore, is also 1 ten (1 group of ten).

They also understand that the numeral 4 in 14, represents 4.

DID YOU KNOW?
In the Foundation Phase, learners talk about 'tens' and 'units' as 'groups of ten' and single 'ones'. They represent two-digit and three-digit numbers using grouping models and expanding number cards.

We do not introduce place value in Grade R. The focus in this grade is on understanding the value of the numbers 0–10 and on building a strong number concept within this range. If learners have a good concept of the numbers to 10, this knowledge can be extended in Grade 1 and other grades.

 **Activity 5**

IMPORTANT!
This activity is for the development of your own knowledge and enrichment. It is not appropriate for Grade R learners. Do NOT introduce this activity in Grade R.

Use the counters, sticks and number cards provided to represent the following numbers:

14 31 22 43

1. Represent each number using counters: make groups of ten and single ones.
2. Represent each number using sticks and string: make bundles of ten and single ones.
3. Label the bundles with the correct number cards.
4. Talk about how many groups of ten and how many ones each number has.
5. Discuss the value of each numeral.
6. Which apparatus do you think was more appropriate for representing the concepts of 'groups of ten' ('tens') and 'ones'? Explain you answer.

_____
_____
_____
_____

7. What do you notice about the value of the numerals in the numbers you represented with the number cards?

_____
_____
_____
_____

Grade R learners **do not need to understand place value**. They do need to:

- understand the value (the 'how muchness') of numbers 0–10
- understand the different combinations of numbers up to 10
- understand that even though 10 is made up of the numerals 1 and 0, it is NOT 1 + 0 and it has its own value ('how muchness')
- understand and be able to represent the different values of 1, 0 and 10.

Facilitator's notes

- After **Activity 6**, take feedback from the groups on ideas for teaching the number 10. These could include:
  - number frieze and story
  - dot card activities
  - number washing line
  - comparing groups of objects
  - structure beads
  - number track.
- Discuss whether these activities would be suitable for whole class, teacher-guided or small group activities.
- Emphasise that when applying the number symbol 10 to a group of objects, learners should use the number symbol card '10' and not number symbol cards '1' and '0'.

 **Activity 6**

1. In your group, discuss ideas for teaching the number 10 in your Grade R classroom. Include the use of different representations.

_____
_____
_____
_____
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_____
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_____

2. Present your ideas to the whole group.

Introducing number 0

In Grade R, learners need to understand that zero is a number and the number symbol for it is '0'.

Young children find the concept of 'emptiness' difficult to understand. When learners are faced with an empty plate, container, box or bag they will often use words such as 'no more', 'all gone', 'nothing left', 'none' or 'empty' to describe the situation. Teachers

should accept these correct descriptions, but should also introduce the word 'zero'. The word 'zero' should be used consistently, even when counting down or backwards, e.g., when counting backwards from four: 'four, three, two, one, zero'. The symbol '0' should be placed on the number washing line. The 0 number cards should be used to represent that an object (such as a plate, tub, lid, box) is empty.

Video 2

Activity Guide: Term 4, Week 3, Day 1 #4 and #5, Day 2 #2 and #4, Day 3 #3, Day 4 #4, Day 5 #4 (pages 29–32)

1. Watch the video of a teacher introducing and consolidating the concept of zero.
   - What do you see happening?
   - How was the concept of zero introduced?
   - What did the learners do and say?
   - What was the role of the teacher?
   - What was the benefit of using a variety of activities to teach the concept?

2. Write down your observations.

_____

_____

_____

_____

Facilitator's notes

- Discuss the kinds of classroom activities that were used to help learners understand the value of '0', for example:
  - adding '0' to the jumping number track and asking what number the learner started on ('no jumps yet')
  - counting groups of objects that include 0 objects
  - matching empty groups of objects to the '0' number card
  - including '0' in the counting sequence (on the number line)
  - showing empty hands to represent '0'.

Session 4: Planning for teaching **1½ hours**

This workshop session prepares participants for implementing Term 4 Weeks 1–3. By this stage of the year, the teacher will have noticed distinct differences between learners' levels of progress. Term 4 builds on the content of Terms 1, 2 and 3. 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 Grade 1.

Facilitator's notes

- Move between the small groups as participants discuss the planning and preparation for teaching Term 4 Weeks 1–3 in **Activity 7**. Assist them by making suggestions on overcoming challenges.
- Each small group plans the three weeks and completes the templates in Appendix A.
- The small groups present their responses to the questions in **Activity 7**. The whole group discusses differentiated teaching and learning.

Activity 7

1. In your group, complete the planning templates for Term 4 Weeks 1–3 (Appendix A).
2. Discuss the following questions:
   - How is the week structured?
   - How does the content build on previous lessons?
   - Do the whole class activities successfully create opportunities for the discussion and exploration of new knowledge?
   - 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?
   - How could you prepare additional activities to support learners who have not yet mastered a particular skill?
   - Suggest some ways to extend learning opportunities for advanced learners.
   - How could you work with a colleague to prepare for each week?

Closing activities

30 minutes

Facilitator's notes

- **Workshop reflection:** Ask participants to take a few minutes to reflect on the day and to page through their *Participant's Workbook*. Ask them to jot down any questions or comments to share with the whole group.
  Ask individual participants to volunteer responses to the following:
  - I learnt …
  - I did not like …
  - I enjoyed …
  - I now understand …
  - I'm still not clear about …
  - I would like more information on …
- Encourage participants to add any comments and feedback not yet shared to the post box.
- **Take back to school task:** Read through this task. Ask if there is anything that is not clear and that requires more explanation.
- **Evaluation:** Hand out copies of the Workshop Evaluation Form and have participants complete the form.
- **Next workshop:** Give dates for the next workshop and close the workshop.

Activity 8

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.

- I learnt _____
  _____
- I did not like _____
  _____
- I enjoyed _____
  _____
- I now understand _____
  _____
- I'm still not clear about _____
  _____
- I would like more information on _____
  _____

Share your reflections with the whole group.

Take back to school task

1. Use *Activity Guide: Term 4* to plan and implement Term 4 Weeks 1–3 of the Maths Programme.
2. 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.
3. Make notes of what worked well, what did not work well and how you resolved any challenges during your implementation of Term 4 Weeks 1–3.
4. Bring your learner observation book and the notes you made when reflecting on each day's teaching to the next workshop.

Evaluation

Complete the Evaluation Form.

APPENDIX A: TERM 4 WEEKLY PLANNING TEMPLATE

Term 4: Activity Plan: Week ____

<table>
<tr><td colspan="5">CONTENT AREA:</td></tr>
<tr><td colspan="5">TOPIC:

INTRODUCE NEW KNOWLEDGE:

PRACTISE:</td></tr>
<tr><td colspan="2">Whole class activities</td><td>Teacher-guided activity</td><td colspan="2">Workstation activities (independent small group activities)</td></tr>
<tr><td>Day 1</td><td></td><td rowspan="5"></td><td>Activity 1</td><td rowspan="5"></td></tr>
<tr><td>Day 2</td><td></td><td>Activity 2</td></tr>
<tr><td>Day 3</td><td></td><td>Activity 3</td></tr>
<tr><td>Day 4</td><td></td><td>Activity 4</td></tr>
<tr><td>Day 5</td><td></td></tr>
</table>

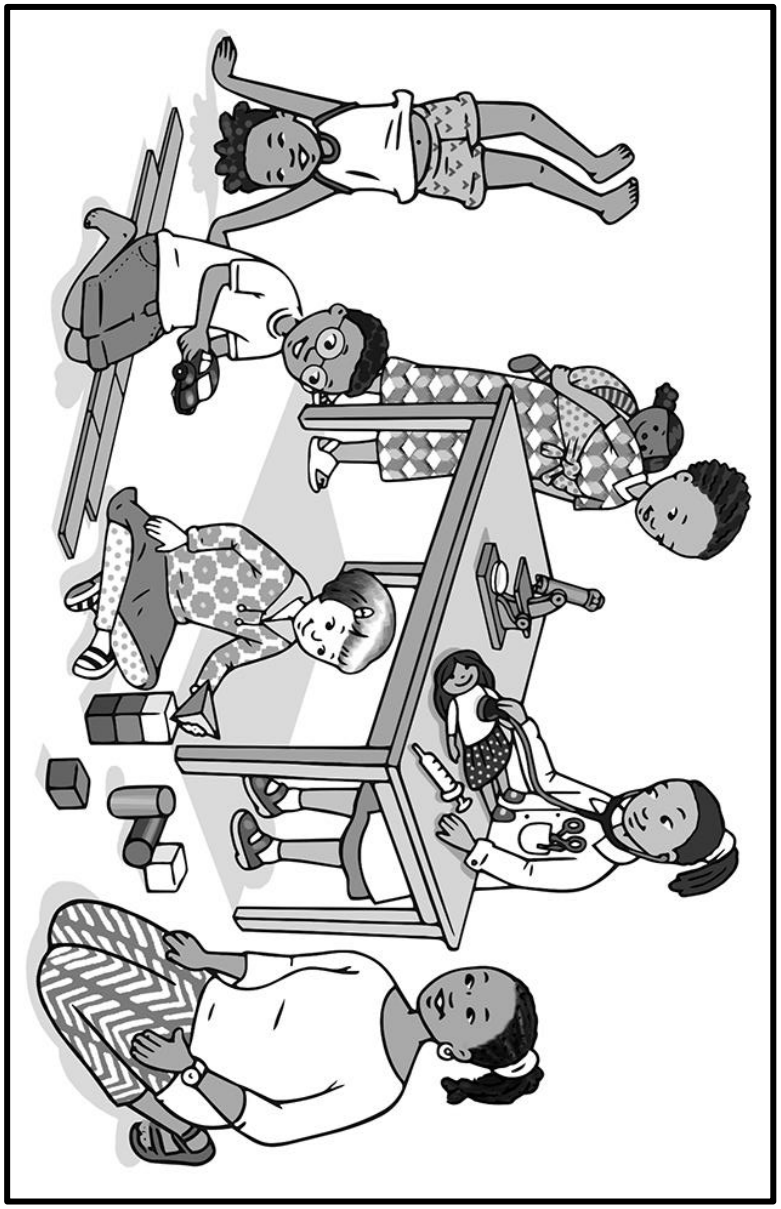
Term 4: Activity Plan: Week ____

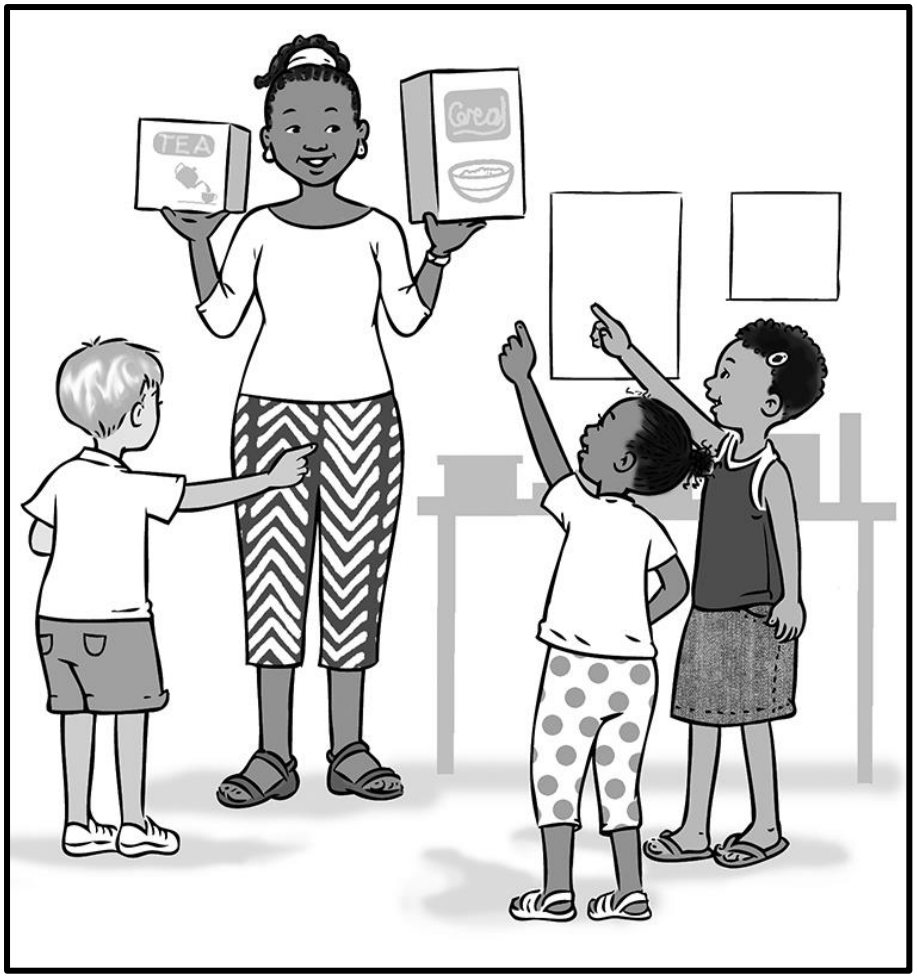
CONTENT AREA:				
TOPIC: **INTRODUCE NEW KNOWLEDGE:** **PRACTISE:**				
Whole class activities		**Teacher-guided activity**	**Workstation activities (independent small group activities)**	
Day 1			**Activity 1**	
Day 2			**Activity 2**	
Day 3			**Activity 3**	
Day 4			**Activity 4**	
Day 5				

Term 4: 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				

APPENDIX B: THE GUIDING PRINCIPLES OF TEACHING MATHS IN GRADE R (PICTURES)

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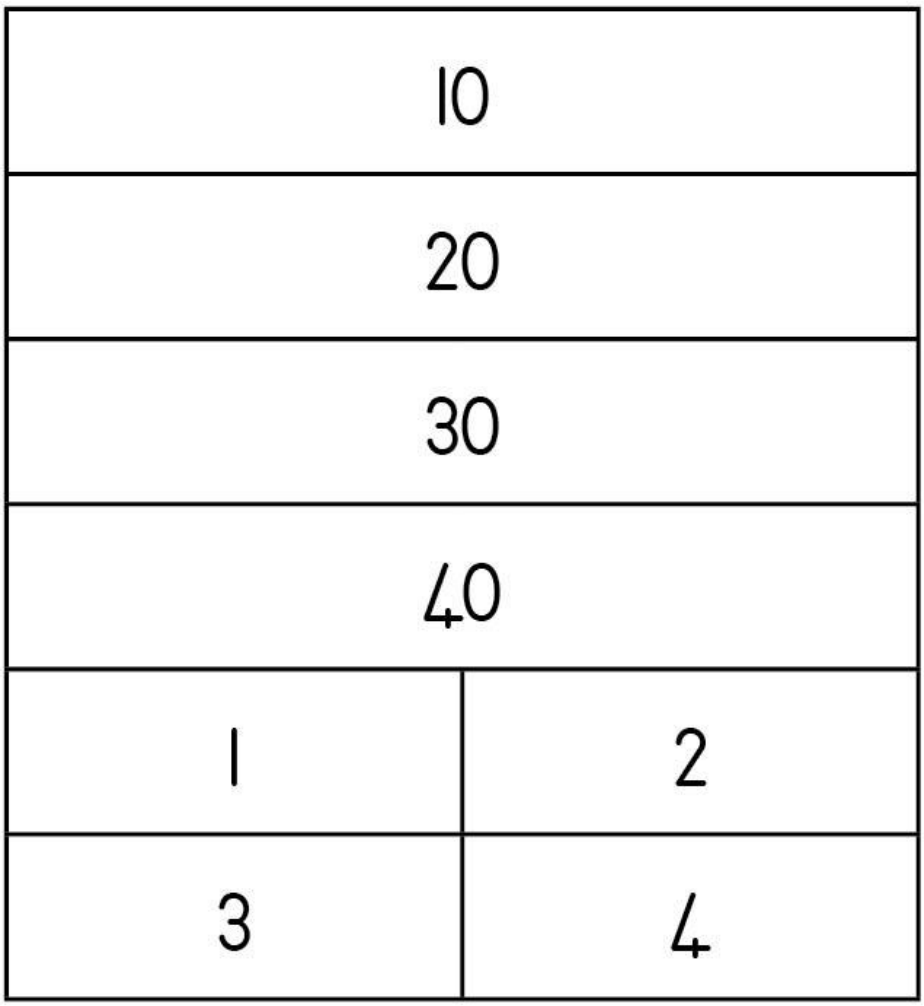
APPENDIX C: EXPANDING NUMBER CARDS



Workshop 10 Evaluation Form

1. Did the workshop meet your expectations?

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_____
_____
_____

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?

_____
_____
_____
_____