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GROWING GAUTENG TOGETHER

Sesotho/English

Lenaneo le Ntlafaditsweng la Mmetse la Kereiti ya R
Grade R Mathematics Improvement Programme

Wekshopo ya 9 ● Workshop 9
Tataiso ya Motsamaisi ● 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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Projeke ya Mmetse wa Kereiti ya R le Ntlafatso ya Puo ke bohato ba pele ba **Lefapha la Thuto la Gauteng (Gauteng Department of Education)** le molekane wa lona wa sehlooho, **Gauteng Education Development Trust**.

Ntshetsopele le tlhahiso ya mehlodi ya thupelo le ya phaposi ya borutelo bakeng sa Projeke ya Mmetse wa Kereiti ya R le Ntlafatso ya Puo di ile tsa tswelletswa ke tshehetso ka ditjhelete ya diprojeke e fanweng ke **United States Agency for International Development** le **Zenex Foundation**.

Projeke ya Mmetse wa Kereiti ya R le Ntlafatso ya Puo e tsamaiswa ke **JET Education Services** mmoho le **Schools Development Unit** ya **UCT** le **Wordworks** jwaloka balekane ba setegeniki.

Schools Development Unit (SDU) ya **University of Cape Town** (UCT) ke molekane wa setegeniki wa mmetse bakeng sa Projeke ya Mmetse wa Kereiti ya R le Ntlafatso ya Puo. SDU ke yuniti e kahara School of Education sa UCT e tsepameng ho ntshetsopele ya porofeshene ya matitjhere ho Mmetse, Saense, Tsebo ya ho Bala le ho Ngola/Puo le Bokgoni ba Bophelo ho tloha ho Kereiti ya R ho isa ho Kereiti ya 12. SDU e fana ka mangolo a botitjhere le a dithuto tse kgutshwane tse ananetsweng tsa UCT, mosebetsi o theilweng dikolong, ntshetsopele ya disebediswa le diphuputso bakeng sa ho tshehetsa ho ruta le ho ithuta dikarolong tsohle tsa Afrika Borwa.

DITEBOHO

Diteboho tse kgethehileng ho:

- Baofisiri ba Botsamaisi ba Kharikhulamo, Botsamaisi ba Thuto ya Matitjhere le Botsamaisi ba Thuto e Kgethehileng ba Lefapha la Thuto la Gauteng, bakeng sa nyehelo ya bona ntlafatsong ya disebediswa tsa rona tsa thuto.
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Overview

Purpose

This is the nineth of twelve Grade R Mathematics Improvement Programme (Maths 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)

Tjhebokakaretso

Sepheo

Ena ke ya borobong ya diwekshopo tse leshome le metso e mmedi tsa Lenaneo le Ntlafaditsweng la Mmetse la Kereiti ya R (Lenaneo la Mmetse), tse etsang karolo ya Lefapha la Thuto la Gauteng (GDE) Projeke ya Mmetse wa Kereiti ya R le Ntlafatso ya Puo.

Sepheo sa wekshopo ena ke ho thusa matitjhere ho kenya tshebetsong Lenaneo la Mmetse ka diphaposing tsa bona tsa borutelo. Bankakarolo ba tla ba le monyetla wa ho sekaseka ho kenya tshebetsong ha bona ha Lenaneo la Mmetse mme ba buisane ka ho rera, ho ruta le tekanyetso tsa bona. Hape ba tla lemoha kgatelopele ya baithuti, le ditlhoko tsa ho ithuta le tsa ntshetsopele tsa moithuti ka mong. Bankakarolo ba tla sekaseka mawa a nepahetseng a tekanyetso bakeng sa ho tlaleha kgatelopele ya baithuti. Wekshopo ena e sibolla dikahare tsa Kotara ya 3 Dibeke tsa 7–10 le ho kenngwa tshebetsong ha tsona diphaposing tsa borutelo.

Dintlha tse buang ka Dikarolo tsa Dikahare tsa Mmetse wa Kereiti ya R di nkilwe ho *Setatemente sa Leano la Kharikhulamo le Tekanyetso (SLKT): Mmetse wa Kereiti ya R (Moralo wa Moshwelella)*, 2011, Lefapha la Thuto ya Motheo, Afrika Borwa.

Diphetho tsa ho ithuta

- Ho shebisisa ho kenya tshebetsong ha Kotara ya 3 Dibeke tsa 4–6
- Ho sibolla mawa a theilweng papading ho tshehetsa ho ruta mmetse Kereiting ya R
- Ho tebisa kutlwisiso ya kgopolo ya nomoro ho Karolo ya Dikahare tsa Dinomoro, Matshwao le Dikamano le ho di hokanya ho ho kenngwa tshebetsong ha mmetse phaposing ya borutelo ya Kereiti ya R
- Ho tebisa kutlwisiso ya tekanyetso e loketseng Kereiting ya R
- Ho sekaseka diphephetso le ho fumana ditharollo bakeng sa ho kenya tshebetsong Lenaneo la Mmetse
- Ho ngola ka ho hlaka dikahare tsa Lenaneo la Mmetse tse lokelang ho rutwa Kotareng ya 3 Dibekeng tsa 7–10

Dikahare tsa wekshopo

- Pulo le boikgopotso (Hora e 1)
- Karolo ya 1: Dinomoro, Matshwao le Dikamano (Hora e 1)

TEYE

- Karolo ya 2: Dinomoro, Matshwao le Dikamano (e tswela pele) (Hora e 1)
- Karolo ya 3: Ho etsa dipalo Kereiting ya R (Hora e 1)

DIJO TSA MOTSHEARE

- Karolo ya 4: Ho etsa moralo bakeng sa ho ruta (Dihora tse 1½)
- Diketsahalo tsa ho kwala (Metsotso e 30)

Preparation

- PPT welcome and outcomes
- Familiarise yourself with all the PowerPoints and videos
- Read:
  Concept Guide, pages 138–161
  Activity Guide: Term 3, pages 120–185
- Bring the post box
- Remind participants to bring their:
  Concept Guide
  Activity Guide: Term 2
  Activity Guide: Term 3
  Poster Book
- Write the following sentences on four large strips of paper:
  I learnt …
  I did not like …
  I now understand …
  I'm still not clear about …
- Cut A4 paper strips for each group.

Materials

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

Tokisetso

- PPT kamohelo le diphetho
- Itlwaetse *PowerPoints* le divideo tsohle
- Bala:
  Tataiso ya Mareo, maqephe a 138–161
  Tataiso ya Diketsahalo: Kotara ya 3, maqephe a 120–185
- Tloo le lebokoso la poso
- Hopotsa bankakarolo ho tla le:
  Tataiso ya Mareo
  Tataiso ya Diketsahalo: Kotara ya 2
  Tataiso ya Diketsahalo: Kotara ya 3
  Buka ya Diphoustara
- Ngola dipolelo tse latelang dikgetjhaneng tse kgolo tse nne tsa pampiri:
  Ke ithutile …
  Ha ke a rata …
  Jwale ke utlwisisa …
  Ke ntse ke eso hlakelwe ke …
- Seha dikgetjhana tsa pampiri ya A4 bakeng sa sehlotshwana ka seng.

Disebediswa

- Pampiri ya fliptjhate, dikoki
- Prestik
- *Khiti ya Disebediswa* bakeng sa sehlopha ka seng

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.

Facilitator's notes

- PPT: Learning outcomes of the workshop.
- Put the sentence strips on the wall:
  - I learnt …
  - I did not like …
  - I now understand …
  - I'm still not clear about …
- Place A4 paper strips on each table. Participants write their responses to the sentence strips on the A4 paper strips. Use Prestik to display their strips under the relevant sentences.
- Discuss the post box comments and feedback from the previous workshop. Remind participants to 'post' any new comments and feedback during the workshop.

Reflection on implementation

Facilitator's notes

- Remind participants of the *Take back to school task* from the end of Workshop 8.
- Refer participants to **Activity 1** and **2** and read through the instructions. Participants complete the activities in their groups. Groups then share key points with the large group.
- After the small group discussions, take comments from each group. Summarise the successes and challenges and discuss the implications for classroom 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.

Pulo le boikgopotso

Hora e 1

Boikgopotso bo kenyeletsa ho nahana le ho bua ka boiphihlelo ba hao le tseo o ithutileng tsona. Nahana ka diwekshopo tsa Mmetse tseo o kileng wa ya ho tsona mme o qetelle dipolelo tseo motsamaisi a di bontshang.

Dinoutso tsa motsamaisi

- PPT: Diphetho tsa ho ithuta tsa wekshopo.
- Bea dikgetjhana tsa dipolelo leboteng:
  - Ke ithutile …
  - Ha ke a rata …
  - Jwale ke utlwisisa …
  - Ke ntse ke eso hlakelwe ke …
- Bea dikgetjhana tsa pampiri ya A4 tafoleng ka nngwe. Bankakarolo ba ngola dikarabo tsa bona tsa dikgetjhana tsa dipolelo hodima dikgetjhana tsa pampiri ya A4. Sebedisa Prestik ho manamisa dikgetjhana tsa bona ka tlasa dipolelo tse nepanang le tsona.
- Buisanang ka ditshwaelo tsa lebokoso la poso le ditlaleho tse tswang diwekshopong tse fetileng. Hopotsa bankakarolo ho 'posa' ditshwaelo le ditlaleho dife kapa dife tse ntjha nakong ya wekshopo.

Boikgopotso mabapi le ho kenya tshebetsong

Dinoutso tsa motsamaisi

- Hopotsa bankakarolo ka *Mosebetsi wa kgutlela le yona sekolong* o tswang qetellong ya Wekshopo ya 8.
- Ere bankakarolo ba shebe **Ketsahalo ya 1** le **2** mme ba bale ditaelo. Bankakarolo ba phethela diketsahalo dihlotshwaneng tsa bona. Dihlotshwana jwale di abelana ka dintlha tsa sehlooho le sehlopha se seholo.
- Kamora dipuisano tsa dihlotshwana, nka ditshwaelo tse tswang ho sehlotshwana ka seng. Akaretsa dikatleho le diphephetso mme le buisane ka ditlamorao tsa ho di kenya tshebetsong ka phaposing ya borutelo.

Mosebetsi wa kgutlela le yona sekolong wa Wekshopo ya 8, o ne o batla hore wena o etse dintho tse latelang:

- Sebedisa *Tataiso ya Diketsahalo: Kotara ya 3* bakeng sa ho rera le ho kenya tshebetsong Kotara ya 3 Dibeke tsa 4–6 tsa Lenaneo la Mmetse.
- Ngola ditshwaelo ka hara buka eo o e sebedisang ho latela kgatelopele ya moithuti ka mong (buka ya ditemoho ya moithuti), mme o sebedise lenane la ditemoho la **'Lekola hore baithuti ba kgona ho'** nakong ya ketsahalo ka nngwe ya tse tataiswang ke titjhere bakeng sa ho tataisa ditemoho le ditshwaelo tsa hao.
- Ngola dinoutso tsa tse sebeditseng hantle, tse sa sebetsang hantle le kamoo o ileng wa rarolla diphephetso dife kapa dife nakong ya ho kenya tshebetsong ha Kotara ya 3 Dibeke tsa 4–6.

Diketsahalong tse latelang sebedisa buka ya hao ya ditemoho tsa baithuti le dinoutso tseo o di entseng ha o ne o ikgopotsa ho ruta ha letsatsi ka leng.

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

Activity Guide: Term 3, Week 6, Teacher-guided activity (pages 114–117)

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.

_____
_____
_____
_____

Ketsahalo ya 1

1. Sehlotshwaneng sa lona, abelanang ka dikatleho le diphephetso tsa lona ha le kenya tshebetsong Lenaneo la Mmetse ho Kotara ya 3 Dibeke tsa 4–6. Abelanang ka mawa bakeng sa ho ntlafatsa ho ruta le ho ithuta bakeng sa diphephetso tseo le di hlwaileng.

_____
_____
_____

2. Buisanang ka tshebediso ya lona ya lenane la ditemoho (lebokosong la leihlo) la **'Lekola hore baithuti ba kgona ho'** nakong ya e nngwe le e nngwe ya diketsahalo tse tataiswang ke tijhere.
   Bontsha ditho tsa sehlotshwana sa hao buka ya ditemoho ya baithuti.
   Kgetha moithuti a le mong mme le buisane ka ditemoho tsa lona tsa kgatelopele ya moithuti eo.

_____
_____
_____
_____
_____
_____

3. Ngola dintlha tsa sehlooho tsa puisano ya lona pampiring ya fliptjhate. Tlalehang puisano ya lona sehlopheng se seholo

Video ya 1

Tataiso ya Diketsahalo: Kotara ya 3, Beke ya 6, Ketsahalo e tataiswang ke titjhere (maqephe a 114–117)

Shebellang video ya titjhere a sebetsa le sehlotshwana sa baithuti nakong ya ketsahalo e tataiswang ke titjhere ho Kotara ya 3 Beke ya 6. Tsepamiso ya temoho ya rona wekshopong ena e ho kamoo titjhere a kenang dipakeng ka teng diketsahalong tsa dinomoro.

Lemoha kamoo titjhere a sebetsanang le diketsahalo tse tsheletseng ka teng. Lemoha:

- kamoo a beang bothata ka teng
- puo eo a e sebedisang ha a botsa dipotso
- kamoo a hlophisang ketsahalo ka nngwe ka teng
- dipotso tseo a di botsang ho tataisa baithuti.

_____
_____
_____
_____

_____
_____
_____
_____

 **Activity 2**

Refer to the teacher-guided activity (pages 114–117) 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?

_____
_____
_____

Facilitator's notes

Show the video and lead a discussion based on the maths activities and questions. If participants do not mention the following points, add them to the discussion.

- The activities are short. The teacher doesn't linger unnecessarily when handing out apparatus or talk to one learner for too long. Transitions are quick and the teacher manages the six activities within the allocated time.
- Both the questions asked and language used are clear and concise.
- Activities build on previous knowledge and expand new ideas.
- Listening to and observing **each** learner provides insight into their progress. It helps you to identify their abilities and the gaps in their skill and/or understanding.

_____
_____
_____
_____

 **Ketsahalo ya 2**

Shebang ho ketsahalo e tataiswang ke titjhere (maqephe a 114–117) ho Beke ya 6 ya *Tataiso ya Diketsahalo: Kotara ya 3*.

1. Buisanang kamoo le tsamaisitseng ketsahalo ena e tataiswang ke titjhere le bana ba tlelase ya lona.

_____
_____
_____

2. Na o ile wa kopana le diphephetso tse itseng? Ha ho le jwalo, o ile wa di rarolla jwang?

_____
_____
_____

Dinoutso tsa motsamaisi

Bontsha video mme o etelle pele puisano e theilweng ho diketsahalo le dipotso tsa mmetse. Haeba bankakarolo ba sa bue ka dintlha tse latelang, di kenyeletse puisanong.

- Diketsahalo di kgutshwane. Titjhere ha a nke nako e telele ho sa hlokahaleng ha a aba disebediswa kapa a bue le moithuti a le mong nako e telele haholo. Diphetoho di potlakile mme titjhere o tsamaisa diketsahalo tse tsheletseng nakong eo di e abetsweng.
- Ka bobedi dipotso tse botswang le puo e sebediswang di hlakile mme di tobile.
- Diketsahalo di ahella ho tsebo e fetileng mme di atolosa mehopolo e metjha.
- Ho mamela le ho shebella moithuti **ka mong** ho fana ka lesedi kgatelopeleng ya hae. Ho o thusa ho hlwaya bokgoni ba hae le dikgeo tse ho bokgoni ba hae le/kapa kutlwisiso ya hae.

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

Facilitator's notes

- Oral counting involves saying the number words in order. Learners sequence numbers during routine oral counting activities and during transitions. Songs, rhymes and actions make oral counting fun while learning 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.
- Choose one group to present their **Activity 3** discussion.

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

As we know, oral counting involves saying the number words 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.

Karolo ya 1: Dinomoro, Matshwao le Dikamano

Hora e 1

Diwekshopong tse fetileng re buisane ka Karolo ya Dikahare ya Dinomoro, Matshwao le Dikamano. Karolong ena re tla etela hape dihlooho tse fapaneng tsa dinomoro le ho atolosa puisano ya rona hore re utlwisise haholwanyane kgopolo ya dinomoro. Re tla sibolla dintlha tse latelang tsa nomoro mme re di hokanye le diketso tsa phaposing ya borutelo:

- ho bala ka molomo
- ho akanya
- ho emela nomoro
- ho bala dintho
- dinomoro tsa boemo
- ho sebetsa dipalo.

Ho bala ka molomo

Dinoutso tsa motsamaisi

- Ho bala ka molomo ho kenyeletsa ho bitsa mabitso a dinomoro ka tatelano. Baithuti ba hlahlamanya dinomoro nakong ya diketsahalo tsa ho bala ka molomo tsa tlwaelo le nakong ya diphetoho. Dipina, diraeme le diketso di etsa hore ho bala ka molomo ho be monate ha ba ntse ba ithuta tatelano ya dinomoro. Hang ha baithuti ba kgona ho pheta tlhahlamano ya dinomoro ka tsela e nepahetseng ya ho bala, ba qala ho bua ka kamano pakeng tsa dinomoro, mohl. ke nomoro efe e tlang pele, e dipakeng kapa kamora nomoro e nngwe.
- Kgetha sehlotshwana se le seng ho nehelana ka puisano ya bona ya **Ketsahalo ya 3**.

Bana ba ithuta tatelano e nepahetseng ya mabitso a dinomoro ha ba ntse ba bapala, ba bina, le ho pheta diraeme.

Jwaloka ha re tseba, ho bala ka molomo ho kenyeletsa ho bitsa mabitso a dinomoro ka tatelano. Baithuti ba hlahlamanya dinomoro nakong ya diketsahalo tsa ho bala ka molomo tsa tlwaelo le nakong ya diphetoho. Dipina, diraeme le diketso di etsa hore ho bala ka molomo ho be monate, empa tsepamiso e ho tatelano ya dinomoro. Hang ha baithuti ba kgona ho pheta tlhahlamano ya dinomoro ka tsela e nepahetseng ya ho bala, ba qala ho bua ka dikamano pakeng tsa dinomoro, mohl. ke nomoro efe e tlang *pele, dipakeng* kapa *kamora* nomoro e nngwe.

Ketsahalo ya 3

Sehlotshwaneng sa lona, buisanang ka kamoo diketsahalo tse latelang di phahamisitseng ho ithuta tatelano ya mantswe a ho bala dintho ka tlelaseng ya hao:

- dipina le diraeme
- mola wa ho aneha dinomoro
- ho tlola diporo.

_____
_____
_____
_____
_____

Facilitator's notes

- PPT: Different 'meanings' of number and different kinds of numbers.
- Discuss different 'meanings' of number and different kinds of numbers, and the focus of number in Grade R.

Activity 4

Read the information on pages 138–143 and look at the diagram at the top of pages 144–145 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.

_____
_____
_____
_____
_____

Dinoutso tsa motsamaisi

- PPT: 'Meelelo' e fapaneng ya nomoro le mefuta e fapaneng ya dinomoro.
- Buisanang ka 'meelelo' e fapaneng ya nomoro le mefuta e fapaneng ya dinomoro, le tsepamiso ya nomoro Kereiting ya R.

Ketsahalo ya 4

Bala tlhahisoleseding ho maqephe a 138–143 mme o shebe setshwantsho se hodimo maqepheng a 144–145 a *Tataiso ya Mareo*.

Sehlotshwaneng sa lona, buisanang ka dintlha tse latelang tsa nomoro:

- 'meelelo' e fapaneng ya nomoro

_____
_____
_____
_____

- mefuta e fapaneng ya dinomoro

_____
_____
_____
_____

Baithuti ba Kereiti ya R ba sebetsa haholoholo ka dinomoro tse felletseng 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 le 10. (Kereiting ya 1 sena se atolositswe ho fihla ho 20 le ho feta.) Re tsepamisa maikutlo ho ho bala le ho emela nomoro ka ditsela tse fapaneng le ho fana ka menyetla ho baithuti ho sebetsa ka dinomoro maemong a fapaneng.

Subitising

Facilitator's notes

- Use the dot cards from the *Resource Kit*.
- Ask participants to tell you 'how many' they see as you flash each dot card quickly:
  - Show a card with 3 dots.
  - Show a card with 2 dots.
  - Hold the above cards alongside each other.
- Explain what subitising is (*Concept Guide* pages 144–147) and discuss how this skill benefits children as they learn about number:
  - Learners associate number names with small collections.
  - Learners recognise the total in a collection (up to five) without counting.
  - Learners start to recognise that, for example, 'five and one is six'.
  - It builds number sense.
  - Learners understand that a number can be broken down and built up. (These number combinations lay the foundation for bonds.)
  - It builds the memorisation and automation of number facts.
- Discuss classroom activities that reinforce subitising. These include:
  - dot card activities
  - structure beads
  - dice games
  - dominoes
  - shake-and-break activities.

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?

_____
_____
_____
_____

Ho akanya

Dinoutso tsa motsamaisi

- Sebedisa dikarete tsa matheba tse tswang ho *Khiti ya Disebediswa*.
- Kopa bankakarolo ho o bolella hore ba bona 'a makae' ha o ntse o fetisa karete ka nngwe ya matheba ka potlako:
  - Bontsha karete e nang le matheba a 3.
  - Bontsha karete e nang le matheba a 2.
  - Phahamisa dikarete tse ka hodimo tsena di bapile.
- Hlalosa seo kakanyo e leng sona (*Tataiso ya Mareo* maqephe a 144–147) mme le buisane kamoo bokgoni bona bo tswelang bana molemo ha ba ntse ba ithuta ka nomoro:
  - Baithuti ba amanya mabitso a dinomoro le dipokello tse nyane.
  - Baithuti ba lemoha palo yohle e pokellong (ho fihlela ho hlano) ntle le ho di bala.
  - Baithuti ba qala ho elellwa hore, ho etsa mohlala, 'hlano le nngwe ke tshelela'.
  - E aha kutlwisiso ya dinomoro.
  - Baithuti ba utlwisisa hore nomoro e ka heletswa mme ya ahwa hape. (Metswako ena ya dinomoro e bea motheo bakeng sa dinomoro tse kopaneng (dibonto))
  - E aha ho ithuta ka hlooho le ho iketsa ha dintlha tsa dinomoro.
- Buisanang ka diketsahalo tsa phaposing ya borutelo tse hatellang ho akanya. Tsona di kenyeletsa:
  - diketsahalo tsa dikarete tsa matheba
  - difaha tsa sebopeho
  - dipapadi tsa mataese
  - didomino
  - diketsahalo tsa tsukutlamme o arole.

Ketsahalo ya 5

Shebellang motsamaisi. Nako le nako ha a phahamisa karete, buang kapele kamoo le ka kgonang hore le bona matheba 'a makae'.

1. Na o badile letheba ka leng ka bonngwe? Hobaneng o sa etsa jwalo?

_____
_____
_____
_____

2. O nahana hore molemo wa ho hatella bokgoni ba ho akanya ke ofe?

_____
_____
_____
_____

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

_____
_____
_____
_____

Refer to pages 144–147 of the *Concept Guide*.

Representing number

Facilitator's notes

- PPT: Animation of the diagram in this section that shows the link between a number and its different representations.
- Explain the concept of number as detailed below.
- Explain that learners need to understand each component in order to make the connection between them.
  1. The '5' in the centre of the diagram is the number 5, and this is an abstract idea.
  2. Learners need to be able to represent the concept of 5 as a collection, using concrete manipulatives, like counters, to represent the number 5.
  3. Learners then need to learn that '5' can be written as a symbol and that the symbol 5 also represents the collection (of counters).
  4. Learners then need to learn that the number word 'five' can be written to represent the symbol and the collection.
  5. Finally, learners need to make the connection between these different representations of five to fully understand the concept.

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.

3. Ke diketsahalo dife tse hatellang bokgoni ba ho akanya boo o ileng wa bo sebedisa dikarolong tsa hao tsa mmetse tsa Kotara ya 1 le 2?

_____
_____
_____
_____

Sheba ho maqephe ana 144–147 a *Tataiso ya Mareo*.

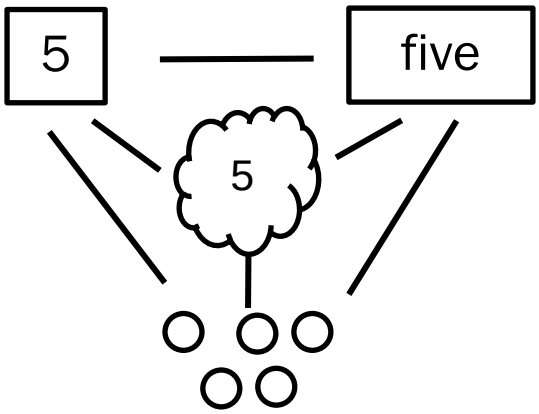
Ho emela nomoro

Dinoutso tsa motsamaisi

- PPT: Ho tshwantshwa ha setshwantsho karolong ena ho bontshang kamano pakeng tsa nomoro le dikemelo tsa yona tse fapaneng.
- Hlalosa kgopolo ya dinomoro jwalokaha ho hlalositswe ka tlase mona.
- Hlalosa hore baithuti ba hloka ho utlwisisa karolo ka nngwe ele hore ba etse kamano pakeng tsa tsona.
  1. '5' e bohareng ba setshwantsho ke nomoro ya 5, mme ke mohopolo o sa tshwareheng.
  2. Baithuti ba lokela ho kgona ho emela lereo la 5 jwaloka pokello, ba sebedisa dintho tse tshwarehang, tse kang dibadi, ho emela nomoro ya 5.
  3. Jwale baithuti ba hloka ho ithuta hore '5' e ka ngolwa e le letshwao le hore letshwao la 5 hape le emela pokello (ya dibadi).
  4. Baithuti jwale ba lokela ho ithuta hore lentswe la nomoro 'hlano' le ka ngolwa ho emela letshwao le pokello.
  5. Qetellong, baithuti ba lokela ho tseba kamano pakeng tsa dikemelo tsena tse fapaneng tsa hlano hore ba utlwisise ka botlalo kgopolo ena.

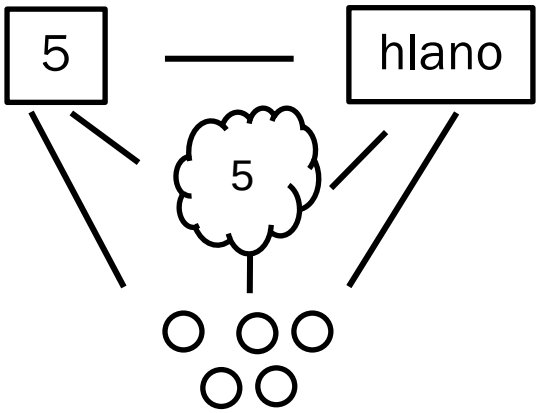
Nomoro ke kgopolo ya ntho e sa tshwareheng. Ke mohopolo o teng ka hloohong ya hao. Re keke ra bona dinomoro, kahoo re lokela ho fumana ditsela tse fapaneng ho emela (bontsha) nomoro eo ho buuwang ka yona. Baithuti ba hloka ho tseba kamano pakeng tsa mohopolo wa nomoro, mohl., 5, le dikemelo tsa yona tse fapaneng, jwaloka pokello ya dintho, letshwao, le lentswe. Hape ba hloka ho utlwisisa hore ha re re, dipompong, ho opa matsoho, dintlo, matsatsi a tswalo, jj. a 'makae', hlano e dula e bolela lenane le lekanang la dintho tsena.

Baithuti ba lokela ho kenya dikelellong tsa bona 'bokaalo' kapa lenane la nomoro. Ho buisana ka kgopolo ena le baithuti, matitjhere a lokela ho tsebisa mohopolo oo ba sebedisa dintho tse tshwarehang, ho etsa mohlala, dibadi. Ho thusa baithuti ho utlwisisa kgopolo ya nomoro, ba hloka ho elellwa hore dinomoro di ka emelwa ka ditsela tse fapaneng. Hape baithuti ba hloka ho etsa kamano pakeng tsa dikemelo tse fapaneng tsa nomoro, ho etsa mohlala, ntho, setshwantsho, letshwao le lentswe.



Facilitator's notes

- Discuss how the idea of multiple representations informs the methodology of introducing a number through a story in the Maths Programme.
- Remind participants of the routine used for teaching each number:
  - Number frieze and story: build the house by showing the picture/s, house number, doorbell/s and number word.
  - Matching objects, number symbols, number words and dot cards.



Dinoutso tsa motsamaisi

- Buisanang kamoo mohopolo wa dikemelo tse ngata o bontshang mokgwa wa ho tsebisa nomoro ka tshebediso ya pale ho Lenaneo la Mmetse.
- Hopotsa bankakarolo ka mokgwatlwaelo o sebediswang bakeng sa ho ruta nomoro ka nngwe:
  - Frizi ya nomoro le pale: ahang ntlo ka ho bontsha se/ditshwantsho, nomoro ya ntlo, di/tshepe ya monyako le lentswe la nomoro.
  - Ho nyalanya dintho, matshwao a dinomoro, mantswe a dinomoro le dikarete tsa matheba.

Session 2: Numbers, Operations and Relationships (continued)

1 hour

Counting objects

Facilitator's notes

- Allow 40 minutes for this section of Session 2.
- PPT: Summarise the counting principles (*Concept Guide* page 148–149). Present them one at a time. These counting principles are the basis of learning to count. Once learners can apply these principles, we can say that they are able to count. Highlight that learners need to be able to demonstrate all five of the counting principles before we can say that they are able count.
- Ask participants to use the apparatus on the table to demonstrate their understanding of each of the counting principles.
- To consolidate, demonstrate each principle to the whole group.
- Discuss the daily classroom activities that reinforce the counting of objects that participants have done in Terms 1 and 2.
- Read the 'In practice' box on page 150 of the *Concept Guide* to explain how learners progress as they learn to count and combine groups of 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 148–151 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	

Karolo ya 2: Dinomoro, Matshwao le Dikamano (e tswela pele)

Hora e 1

Ho bala dintho

Dinoutso tsa motsamaisi
♦ Fana ka metsotso e 40 bakeng sa karolo ena ya Karolo ya 2. ♦ PPT: Akaretsa ntlhatheo ya ho bala (*Tataiso ya Mareo* leqephe la 148–149). Di bontsha e le nngwe ka nako. Dintlhatheo tsena tsa ho bala ke motheo wa ho ithuta ho bala. Hang ha baithuti ba tseba ho sebedisa dintlhatheo tsena, re ka re ba se ba kgona ho bala. Hlakisa hore baithuti ba lokela ho tseba ho bontsha dintlhatheo tsohle tse hlano tsa ho bala pele re ka re ba kgona ho bala. ♦ Kopa bankakarolo ho sebedisa disebediswa tse tafoleng ho bontsha kutlwisiso ya bona ya ntlhatheo ka nngwe ya ho bala. ♦ Ho kgobokanya, bontsha ntlhatheo ka nngwe ho sehlopha sohle. ♦ Buisanang ka diketsahalo tsa phaposing ya borutelo tsa letsatsi le letsatsi tse hatellang ho bala dintho tseo bankakarolo ba di entseng ho Kotara ya 1 le 2. ♦ Bala lebokoso la 'Diketsahalong' ho leqephe la 151 la *Tataiso ya Mareo* ho hlalosa kamoo baithuti ba hatelang pele ha ba ntse ba ithuta ho bala le ho kopanya dihlopha tsa dintho.

Ho bala '**tse kae**', baithuti ba hloka ho elellwa hore ntho ka nngwe sehlopheng e na le lebitso la nomoro le hore o bala ntho ka nngwe hanngwe feela.

Ho na le dintlhatheo tsa ho bala tse hlano tse hlalosang mokgwatshebetso wa ho ithuta ho bala. Hang ha baithuti ba se ba utlwisisa mme ba tseba ho sebedisa dintlhatheo tsena tse hlano tsa ho bala kaofela, re kgona ho re jwale ba se ba tseba ho bala.

Ketsahalo ya 6

Bala tlhahisoleseding e maqepheng a 148–151 a *Tataiso ya Mareo*.

1. Sebedisa disebediswa tse fanweng ho bontsha dintlhatheo tsena jwalokaha di hlalositswe ho *Tataiso ya Mareo*.

2. Buisanang ka ntlhatheo ka nngwe sehlotshwaneng sa lona mme le iketsetse dinoutso tafoleng e ka tlase ho hlalosa kutlwisiso ya lona ya ntlhatheo ka nngwe.

Ntlhatheo ya neeletsano pakeng tsa ntho tse pedi	
Ntlhatheo ya tatelano e sa fetoheng	

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**.

Facilitator's notes

- Allow 20 minutes for this section of Session 2.
- Participants select six animal counters from the *Resource Kit* and arrange these in a row, facing left.
- Ask these questions:
  - Which animal is first?
  - Which animal is second?
  - Where is the chicken placed?
  - Which animal is next?
  - What is the colour of the third animal?

  Note: Participants will have different arrangements of animals, so allow them to give answers according to the order of the animals in their arrangement.
- Ask participants to turn the animals so that they are facing right.
- Repeat the above questions.
- Discuss how ordinal numbers can be practised during daily routines and activities, e.g., while lining up or when doing outdoor races.
- Refer to the number washing line. Ask which number is *first*, *second*, *next to*, *before*.

 **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.

_____

_____

_____

_____

Ntlhatheo ya nomoro ya ho bala	
Ntlhatheo ya tse sa tshwareheng	
Ntlhatheo ya ho se shebe tatelano	

Dinomoro tsa boemo

Re se re buisane ka mefuta ya dinomoro e o bolellang hore ke 'tse kae'. Tsena di bitswa **dinomoro tsa ho bala**.

Hape ho na le dinomoro tse bontshang boemo ba ntho e itseng kapa motho ya itseng letotong kapa tatelanong. Tsena di bitswa **dinomoro tsa boemo**.

Dinoutso tsa motsamaisi

- Fana ka metsotso e 20 bakeng sa karolo ena ya Karolo ya 2.
- Bankakarolo ba kgetha dibadi tse tsheletseng tsa diphoofolo ho *Khiti ya Disebediswa* mme ba di bea ka mola, di shebile ka ho le letshehadi.
- Botsa dipotso tsena:
  - Ke phoofolo efe e leng ya pele?
  - Ke phoofolo efe ya bobedi?
  - Kgoho e behilwe hokae?
  - Ke phoofolo efe e latelang?
  - Phoofolo ya boraro e mmala ofe?

  Lemoha: Bankakarolo ba tla ba le ditlhophiso tse fapaneng tsa diphoofolo, kahoo ba dumelle ho fana ka dikarabo ho ya ka tatelano ya diphoofolo tse tlhophisong ya bona.
- Kopa bankakarolo ho fetola diphoofolo ele hore di shebe ka ho le letona.
- Pheta dipotso tse ka hodimo hape.
- Buisanang kamoo dinomoro tsa boemo di ka ikwetliswang ka teng nakong ya diketso tsa letsatsi le letsatsi le diketsahalo, mohl., ha ba eme moleng kapa ha ba etsa mabelo a ka ntle.
- Shebang mola wa ho aneha dinomoro. Botsa hore ke nomoro efe e leng *ya pele, ya bobedi, e pela, e tlang pele ho*.

Ketsahalo ya 7

Hlophisa dibadi tsa diphoofolo tafoleng ya lona ho ya ka ditaelo tsa motsamaisi. Arabang dipotso tsa hae tse mabapi le boemo ba dibadi tsa diphoofolo.

_____

_____

_____

_____

Session 3: Calculation in Grade R **1 hour**

Facilitator's notes

- Discuss calculation in Grade R by summarising the text below.
- **Activity 8:** Give each small group a different kind of apparatus:
  - counters
  - structure beads
  - dot cards
  - Unifix blocks.

  Note: You will have more than one group with the same kind of apparatus.
- After each group has demonstrated, discuss the different ways learners find out about number combinations through building up and breaking down numbers.
- Point out that understanding numbers greater than 5 is based on number concepts learnt for numbers 5 and less. Reflect on how Terms 1 and 2 have provided experiences for learning about numbers 1–5. This forms the foundation for understanding numbers greater than 5.

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 154–156 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.

Karolo ya 3: Ho etsa dipalo Kereiting ya R

Hora e 1

Dinoutso tsa motsamaisi
♦ Buisanang ka ho etsa dipalo Kereiting ya R ka ho akaretsa mongolo o ka tlase mona. ♦ **Ketsahalo ya 8:** Efa sehlotshwana ka seng mofuta o fapaneng wa disebediswa: - dibadi -difaha tsa sebopeho - dikarete tsa matheba - diboloko tsa Unifix. Lemoha: O tla ba le dihlotshwana tse fetang se le seng tse nang le disebediswa tsa mofuta o tshwanang. ♦ Kamora hoba sehlotshwana ka seng se bontshitse, buisanang ka ditsela tse fapaneng tseo baithuti ba ithutang ka metswako ya dinomoro ka ho aha le ho heletsa dinomoro. ♦ Ba lemose hore ho utlwisisa dinomoro tse kgolo ho 5 ho theilwe ho mareo a dinomoro a ithutilweng bakeng sa dinomoro tsa 5 le tse ka tlase. Ikgopotse kamoo Dikotara tsa 1 le 2 di faneng ka boiphihlelo ka teng bakeng sa ho ithuta ka dinomoro tsa 1–5. Sena se aha motheo bakeng sa ho utlwisisa dinomoro tse kgolo ho 5.

Baithuti ba hloka ho utlwisisa boleng ba dinomoro le dikamano dipakeng tsa tsona pele ba ka etsa matshwao a kang ho kopanya le ho tlosa. Ba lokela ho tseba, ho etsa mohlala, hore tharo ke ntho 'tse kae'; 3 e tla pele ho 4, kamora 2 le dipakeng tsa 2 le 4; mme 3 ke nngwe ka hodimo ho 2 mme ke nngwe ka tlase ho 4.

Ho sebetsa ka dibadi, difaha tsa sebopeho, dikarete tsa matheba, le papadi ya tsukutla mme o arole ho fana ka menyetla bakeng sa baithuti ho utlwisisa hore dinomoro di ka ahwa kapa tsa heletswa. Ka tsela ena, butlebutle ba elellwa hore nomoro efe kapa efe e botjwa ke metswako e mengata e fapaneng ya dinomoro tse ding. Ho etsa mohlala, nomoro ya 5 e ka botjwa ka:

- 4 le 1
- 1 le 1 le 1 le 2
- 0 le 5.

Kereiting ya R, baithuti ba sibolla ditsela tse fapaneng tsa ho aha le ho heletsa dinomoro, le ho kopanya le ho tlosa ba sebedisa dibadi.

Ketsahalo ya 8

Bala tlhahisoleseding e maqepheng a 154–156 a *Tataiso ya Mareo*.

Nahana kamoo o sebedisitseng disebediswa tse fanweng ho Lenaneo la Mmetse ho thusa baithuti ho utlwisisa ditshebetso tsa dinomoro (ho etsa dipalo) le dikamano. Sebedisa disebediswa ho bontsha sena.

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 156 of the *Concept Guide* for examples of questions.)

_____
_____
_____
_____

Prepare to present your discussion to the whole group.

Word problems

Facilitator's notes

- Briefly reflect on word problems and questions discussed in Workshop 6. Explain that when we talk about word problems, we are not referring to open-ended questions. Word problems or 'story sums' are situations/contexts that require Grade R learners to apply addition, subtraction, sharing and grouping strategies.
- In groups, participants solve the word problems in **Activity 9**.
- For each word problem, discuss their responses to the questions.
- Remind participants that the language used needs to be simple and clear. The confusion and difficulty that learners experience when solving word problems is often a result of the language structure used to express the problem, rather than a lack of mathematical understanding.

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.

1. Baithuti ba sibolla jwang kgopolo ya nomoro ho Lenaneo la Mmetse ba sebedisa disebediswa tseo ba di filweng?

2. Ke dipotso dife tseo o ka di botsang tse ka tataisang ho ithuta ha bona? (Sheba ho leqephe la 157 la *Tataiso ya Mareo* bakeng sa mehlala ya dipotso.)

_____
_____
_____
_____

Lokisetsa ho nehelana ka puisano ya lona ho sehlopha sohle.

Dipalo tsa mantswe

Dinoutso tsa motsamaisi

- Ka bokgutshwane hopola dipalo tsa mantswe le dipotso tseo le buisaneng ka tsona ho Wekshopo ya 6. Hlalosa hore ha re bua ka dipalo tsa mantswe, ha re bue ka dipotso tse dikarabo di ngata. Dipalo tsa mantswe kapa 'dipalo tsa pale' ke maemo/tikoloho e batlang hore baithuti ba Kereiti ya R ba sebedise mawa a ho kopanya, ho tlosa, ho arola le ho bea ka dihlopha.
- Ka dihlotshwana, bankakarolo ba rarolla dipalo tsa mantswe tse ho **Ketsahalo ya 9**.
- Bakeng sa palo ka nngwe ya mantswe, buisanang ka dikarabo tsa bona ho dipotso.
- Hopotsa bankakarolo hore puo e sebediswang e lokela ho ba bonolo mme e hlake. Pherekano le bothata tseo baithuti ba kopanang le tsona ha ba rarolla bothata ba dipalo tsa mantswe hangata e bakwa ke sebopeho sa puo e sebedisetswang ho hlalosa bothata, ho ena le bofokodi ba kutlwisiso ya mmetse.

Baithuti ba Kereiti ya R ba lokela ho rarolla dipalo tsa mantswe ka molomo tse kenyeletsang ho kopanya, ho tlosa, le ho arola ka ho lekana le ho bea ka dihlopha. Hape ba hloka ho hlalosa mabaka a bona le ditsela tsa ho rarolla mathata a fapaneng.

Efa baithuti nako e ngata ya ho nahana mme o re ba sebedise dintho tsa nnete (mohl. dibadi, menwana, difaha tsa sebopeho) ho rarolla mathata mme o lekole dikarabo tsa bona.

Ha o hlahisa palo ya mantswe ho baithuti, ho bohlokwa ho ba kgothaletsa ho:
- batla lewa la ho rarolla bothata
- hlalosa kamoo ba rarollotseng bothata ka teng
- bolela hore ke hobaneng ha ba nahana hore dikarabo tsa bona di nepahetse.

Maemo a tlwaelehileng a ho kopanya le ho tlosa a ka hlahiswa e le dipalo tsa mantswe. Tsela eo pale ya mantswe e bopilweng ka yona, e bolela kamoo ho leng bonolo kapa thata ho e rarolla. Ho bohlokwa ho sebedisa puo e hlakileng, e bonolo ha o hlahisa dipalo tsa mantswe.

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:

Ho Wekshopo ya 6 re ile ra sheba bohlokwa ba ho sebedisa puo e hlakileng, e bonolo le ho botsa dipotso tse loketseng nakong ya diketsahalo tsa ho rarolla bothata. Hape re ile ra rala mathata a nnete a bophelo maemong ao baithuti ba ka a utlwisisang. Ho Ketsahalo ya 9, le tla buisana ka ho rarolla bothata ka botebo.

Ketsahalo ya 9

1. Shebang dipalo tsa mantswe tse ka tlase mona.

- O ka rarolla bothata ka bong jwang?
- O nahana hore baithuti ba Kereiti ya R ba ka rarolla bothata ka bong jwang?
- Hobaneng ha a mang a mathata ana a le thata ho feta a mang?
- Sebedisang dibadi tse tafoleng ya lona ho bontsha kamoo baithuti ba ka rarollang mathata ka teng.

Kopanya	Arohanya
Laylah o na le dipompong tse 6. Malusi o mo fa tse ding tse 2. Layla o se a ena le dipompong tse kae kaofela?	Ho na le dipompong tse 8. Laylah o ja dipompong tse 3. Ho setse dipompong tse kae bakeng sa Malusi?
Laylah o na le dipompong tse 5. O hloka tse ding tse kae hore a be le tse 8?	Laylah o na le dipompong tse 8. Malusi o ja tse ding. Ho setse tse 4. Malusi o jele tse kae?
Laylah o ne a ena le dipompong. Malusi o mo fa tse ding tse 2. Jwale o se a ena le tse 8. Layla o ne a ena le tse kae qalong?	Laylah o ne a ena le dipompong. O file Malusi dipompong tse 6. O saletswe ke dipompong tse 2. O qadile a ena le dipompong tse kae?

2. Ngola palo ya mantswe eo o ka e hlahisang ho baithuti ba hao ba Kereiti ya R bakeng sa e nngwe le e nngwe ya tse latelang:

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

_____
_____
_____
_____

Facilitator's notes

- PPT: The 'combine' and 'separate' table.
- In Grade R, most learners will solve problems using these strategies or techniques:
  - counting all
  - using counters or fingers to represent the collections being combined or separated.

  Very few learners will count on from the biggest number because this level of number knowledge is still being developed.
- Ask participants to share their examples with the whole group.

Ho kopanya: 4 + 5 =

_____
_____
_____
_____

Ho tlosa: 7 – 3 =

_____
_____
_____
_____

Ho arola ka ho lekana ntle le e salang: 8 e arolwa pakeng tsa baithuti ba 4

_____
_____
_____
_____

Ho arola ka ho lekana mme ho eba le ho salang: 5 e arolwa pakeng tsa baithuti ba 2

_____
_____
_____
_____

Dinoutso tsa motsamaisi
♦ PPT: Tafole ya ho 'kopanya' le ho 'arohanya'. ♦ Kereiting ya R, baithuti ba bangata ba tla rarolla mathata ba sebedisa mawa le ditsela tsena: - ho bala kaofela - ho sebedisa dibadi kapa menwana ho emela dipokello tse kopantsweng kapa tse arohantsweng. Baithuti ba mmalwa haholo ba tla bala ho tloha ho nomoro e kgolo ka ho fetisisa hobane boemo bona ba tsebo ya dinomoro bo ntse bo ntshetswa pele. ♦ Kopa bankakarolo ho abelana ka mehlala ya bona le sehlopha sohle.

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.

Facilitator's notes

Show the video and discuss the challenges and opportunities for differentiated teaching and learning in Grade R. If participants do not mention the following points, add them to the discussion.

- Learners can all do the same activity, but easier questions can be posed.
- The teacher can offer more guidance to slower/weaker learners and encourage more advanced learners to discuss their reasoning.
- Learners can be placed in ability groups for some activities and in mixed-ability groups for other activities.
- Observation and the recording of observation are important. They enable the teacher to have insight into each learner's progress and to know how to assist learners.

Video 2

Video 1 edited to include a teacher talking about how she manages differentiated teaching and learning, and assessment in her class.

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.

_____
_____
_____
_____
_____
_____
_____
_____

Karolo ya 4: Ho etsa moralo bakeng sa ho ruta

Dihora tse 1½

Karolo ena ya wekshopo e lokisetsa bankakarolo bakeng sa ho kenya tshebetsong Kotara ya 3 Dibeke tsa 7–10. Mokgahlelong ona wa selemo, titjhere o tla be a elelletswe diphapang tse ikgethileng tse pakeng tsa maemo a baithuti a kgatelopele. Kotara ya 3 e ahella ho dikahare tsa Kotara ya 1 le 2. Baithuti ba bang ba tla be ba loketse sena, ha ba bang ba tla hloka tshehetso le matlafatso e ngata bakeng sa ho hatela pele. Ho bohlokwa ho rera le ho lokisetsa phapang ena ya boitsebelo ba baithuti ho netefatsa hore dikahare tsohle le bokgoni bohle ba Mmetse wa Kereiti ya R di entswe, le hore baithuti ba se ba loketse Kotara ya 4.

Dinoutso tsa motsamaisi

Bontsha video mme le buisane ka diphephetso le menyetla bakeng sa ho ruta le ho ithuta ho fapantsweng Kereiting ya R. Haeba bankakarolo ba sa bue ka dintlha tse latelang, di kenyeletse puisanong.

- Baithuti ba ka etsa ketsahalo e le nngwe kaofela, empa dipotso tse bonolo di ka botswa.
- Titjhere a ka fana ka tataiso e fetang ho baithuti ba lenama/fokolang mme a kgothaletsa baithuti ba hatetseng pele ho buisana ka mabaka a bona.
- Baithuti ba ka bewa ka dihlotshwana tsa bokgoni bakeng sa diketsahalo tse itseng le dihlotshwaneng tsa bokgoni bo tswakileng bakeng sa diketsahalo tse ding.
- Temoho le ho rekotwa ha ditemoho di bohlokwa. Di etsa hore titjhere a kgone ho ba le lesedi ka kgatelopele ya moithuti ka mong le ho tseba hore a ka thusa baithuti jwang.

Video ya 2

Video ya 1 e hlophisitswe ho kenyeletsa titjhere ya buang ka kamoo a tsamaisang ho ruta le ho ithuta ho fapantsweng, le tekanyetso ka tlelaseng ya hae.

Shebellang video ya titjhere ya buang kamoo a sebetsanang le letoto la boitsebelo ba baithuti ka tlelaseng ya hae. Mamelang seo a se buang mabapi le ho rera le ho laola phapang pakeng tsa maemo a bokgoni ba baithuti le kamoo a tsamaisang morero wa hae kateng ele hore a tshehetse ditlhoko tsa moithuti ka mong.

Ngola mehopolo ya hao mabapi le ho ruta le ho ithuta ho fapantsweng ka phaposing ya hao ya borutelo.

_____
_____
_____
_____
_____
_____
_____
_____

Facilitator's notes

- Move between the groups as participants discuss the planning and preparation for teaching Term 3 Weeks 7–10 in **Activity 10**. Assist by making suggestions on overcoming challenges.
- Each group presents their main discussion points to the whole group.

Activity 10

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?

Dinoutso tsa motsamaisi

- Tsamaya dipakeng tsa dihlotshwana ha bankakarolo ba ntse ba buisana ka moralo le boitokisetso bakeng sa ho ruta Kotara ya 3 Dibeke tsa 7–10 ho **Ketsahalo ya 10**. **Ba** thuse ka ho etsa ditlhahiso mabapi le ho hlola diphephetso.
- Sehlotshwana ka seng se nehelana ka dintlha tsa sona tsa sehlooho tsa puisano ho sehlopha sohle.

Ketsahalo ya 10

1. Sehlotshwaneng sa lona, tlatsang dithempeiti tsa moralo bakeng sa Kotara ya 3 Dibeke tsa 7–10 (Sehlomathiso A).
2. Sehlotshwana sa lona se tla nehelana ka tjhebokakaretso ya puisano ya lona ya ho rera ho dihlotshwana tse ding. Ngolang dintlha tsa sehlooho tsa puisano ya lona pampiring ya fliptjhate. Kenyeletsang dikarabo tsa dipotso tse latelang:
   - Le lebelletse diphephetso dife ha le kenya tshebetsong Dibeke tsa 7–10?
   - Le ka rarolla jwang phephetso ka nngwe ho tseo ele hore le fihlelle ho kenya tshebetsong ho atlehileng?
   - Ketsahalo e tataiswang ke titjhere e fana jwang ka menyetla bakeng sa titjhere ho lekola le ho tshehetsa baithuti?
   - Na diketsahalo tsa dihlotshwana tse ikemetseng di dumella boikwetliso bo lekaneng ba tsebo e ntjha le bokgoni?

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 and write these on the flipchart.
- 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 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.

Diketsahalo tsa ho kwala

Metsotso e 30

Dinoutso tsa motsamaisi

- **Boikgopotso ba wekshopo:** Kopa bankakarolo ho nka metsotso e mmalwa ho ikgopotsa ka letsatsi leo le ho phetla *Buka ya Mosebetsi ya Monkakarolo* tsa bona. Ba kope hore ba ngole fatshe dipotso kapa ditshwaelo dife kapa dife tseo ba tlang ho di abelana le sehlopha sohle**.**
  Kopa bankakarolo ka bonngwe ho ithaopa ho araba mme o ngole dikarabo tseo ho fliptjhate.
- Kgothaletsa bankakarolo ho kenyeletsa ditshwaelo le ditlaleho dife kapa dife tse esong ho abelanwe ho lebokoso la poso.
- **Mosebetsi wa kgutlela le yona sekolong:** Bala mosebetsi ona. Botsa hore ebe ho na le ho sa hlakang le ho hlokang tlhaloso e fetang.
- **Tlhahlobo:** Fana ka dikhopi tsa Foromo ya Tlhahlobo ya Wekshopo mme o re bankakarolo ba tlatse foromo eo.
- **Wekshopo e latelang:** Fana ka matsatsi bakeng sa wekshopo e latelang mme o kwale wekshopo.

Ketsahalo ya 11

Boikgopotso ba wekshopo: Nka metsotso e mmalwa ho ikgopotsa ka letsatsi leo. Phetla *Buka ya Mosebetsi ya Monkakarolo* ya hao ho ikgopotsa ka tse rutilweng. Ngola mehopolo ya hao fatshe.

_____

_____

_____

_____

_____

Abelanang ka boikgopotso ba lona mmoho le sehlopha se seholo.

Mosebetsi wa kgutlela le yona sekolong

1. Sebedisa *Tataiso ya Diketsahalo: Kotara ya 3* bakeng sa ho rera le ho kenya tshebetsong Kotara ya 3 Dibeke tsa 7–10 tsa Lenaneo la Mmetse.
2. Etsa dinoutso tsa dintho tse sebeditseng hantle, tse sa sebetsang hantle le kamoo o ileng wa rarolla diphephetso tse itseng nakong ya ho kenya tshebetsong ha Kotara ya 3 Dibeke tsa 7–10.
3. Ngola ditshwaelo ka hara buka eo o e sebedisang ho latela kgatelopele ya moithuti ka mong (buka ya temoho ya moithuti). Sebedisa lenane la ditemoho (lebokoso la leihlo) la **'Lekola hore baithuti ba kgona ho'** nakong ya ketsahalo ka nngwe ya tse tataiswang ke titjhere bakeng sa ho tataisa ditemoho le ditshwaelo tsa hao.
4. Tloo le buka ya hao ya ditemoho tsa moithuti le dinoutso tseo o di entseng ha o ntse o ikgopotsa ho ruta ha letsatsi ka leng ho wekshopo e latelang.
5. Tloo le khopi ya Kotara ya 3: Rekoto ya Mohlala ya Tekanyetso e Tswellang (ho tswa ho *Tataiso ya Diketsahalo: Kotara ya 3*) wekshopong e latelang.

Evaluation
Complete the Evaluation Form.

Tlhahlobo
Tlatsa Foromo ya Tlhahlobo.

APPENDIX A: TERM 3 WEEKLY PLANNING TEMPLATE

Term 3: 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>

SEHLOMATHISO A: KOTARA YA 3 THEMPLEITI YA MORALO WA BEKE LE BEKE

Kotara ya 3: Moralo wa Ketsahalo: Beke ya ____

<table>
<tr><td colspan="5">KAROLO YA DIKAHARE:</td></tr>
<tr><td colspan="5">SEHLOOHO:

TSEBISA TSEBO E NTJHA:

HO ETSA:</td></tr>
<tr><td colspan="2">Diketsahalo tsa tlelase yohle</td><td>Ketsahalo e tataiswang ke titjhere</td><td colspan="2">Diketsahalo tsa diteisheneng tsa tshebetso (diketsahalo tsa dihlotshwana tse ikemetseng)</td></tr>
<tr><td>Letsatsi la 1</td><td></td><td rowspan="5"></td><td>Ketsahalo ya 1</td><td rowspan="5"></td></tr>
<tr><td>Letsatsi la 2</td><td></td><td>Ketsahalo ya 2</td></tr>
<tr><td>Letsatsi la 3</td><td></td><td>Ketsahalo ya 3</td></tr>
<tr><td>Letsatsi la 4</td><td></td><td>Ketsahalo ya 4</td></tr>
<tr><td>Letsatsi la 5</td><td></td></tr>
</table>

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				

Kotara ya 3: Moralo wa Ketsahalo: Beke ya ____

KAROLO YA DIKAHARE:				
SEHLOOHO: **TSEBISA TSEBO E NTJHA:** **HO ETSA:**				
Diketsahalo tsa tlelase yohle		**Ketsahalo e tataiswang ke titjhere**	**Diketsahalo tsa diteisheneng tsa tshebetso (diketsahalo tsa dihlotshwana tse ikemetseng)**	
Letsatsi la 1			**Ketsahalo ya 1**	
Letsatsi la 2			**Ketsahalo ya 2**	
Letsatsi la 3			**Ketsahalo ya 3**	
Letsatsi la 4			**Ketsahalo ya 4**	
Letsatsi la 5				

Term 3: Activity Plan: Week ____

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

Kotara ya 3: Moralo wa Ketsahalo: Beke ya ____

KAROLO YA DIKAHARE:				
SEHLOOHO: **TSEBISA TSEBO E NTJHA:** **HO ETSA:**				
Diketsahalo tsa tlelase yohle		**Ketsahalo e tataiswang ke titjhere**	**Diketsahalo tsa diteisheneng tsa tshebetso (diketsahalo tsa dihlotshwana tse ikemetseng)**	
Letsatsi la 1			**Ketsahalo ya 1**	
Letsatsi la 2			**Ketsahalo ya 2**	
Letsatsi la 3			**Ketsahalo ya 3**	
Letsatsi la 4			**Ketsahalo ya 4**	
Letsatsi la 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				

Kotara ya 3: Moralo wa Ketsahalo: Beke ya ____

KAROLO YA DIKAHARE:				
SEHLOOHO: **TSEBISA TSEBO E NTJHA:** **HO ETSA:**				
Diketsahalo tsa tlelase yohle		**Ketsahalo e tataiswang ke titjhere**	**Diketsahalo tsa diteisheneng tsa tshebetso (diketsahalo tsa dihlotshwana tse ikemetseng)**	
Letsatsi la 1			**Ketsahalo ya 1**	
Letsatsi la 2			**Ketsahalo ya 2**	
Letsatsi la 3			**Ketsahalo ya 3**	
Letsatsi la 4			**Ketsahalo ya 4**	
Letsatsi la 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?

_____
_____
_____
_____

Foromo ya Tlhahlobo ya Wekshopo ya 9

1. Na wekshopo ena e fihletse ditebello tsa hao?

_____
_____
_____
_____

2. O ithutile eng ho wekshopo ena se o thusitseng ka ho fetisisa?

_____
_____
_____
_____

3. Na ho na le seo o sa kang wa se rata kapa seo o ileng wa thatafallwa ke ho se utlwisisa?

_____
_____
_____
_____

4. O tla sebedisa jwang seo o ithutileng sona mona phaposing ya hao ya borutelo ya Kereiti ya R?

_____
_____
_____
_____

5. Na o na le ditlhahiso tse itseng bakeng sa ho ntlafatsa diwekshopo tse ding tse tlang?

_____
_____
_____
_____