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GROWING GAUTENG TOGETHER

Setswana/English

Lenaneotokafatso la Dipalo tša Mophato R Grade R Mathematics Improvement Programme



**Thutano 9 • Workshop 9
Kaedi ya Mofathosi • 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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Porojeke ya Lenaneotokafatso la Dipalo le Puo tsa Mophato wa R ke itshimololelo ya **Lefapha la Thuto la Gauteng (Gauteng Department of Education)** mmogo le badirisani ba bona ba botlhokwa, **Gauteng Education Development Trust**.

Tlhabolole le tlhagiso ya didiriswa tsa katiso le phaposiborutelo ya Porojeke ya Lenaneotokafatso la Dipalo le Puo tsa Mophato wa R e kgontshitswe ke tshegetso ya **United States Agency for International Development** le **Zenex Foundation** ka matlole.

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Schools Development Unit (SDU) kwa **University of Cape Town (UCT)** ke badirisani ba setegeniki ba dipalo go Porojeke ya Lenaneotokafatso la Dipalo le Puo tsa Mophato wa R. SDU ke yuniti e e ka tlase ga School of Education sa UCT e e totileng tokafatso ya boporofesenele jwa barutabana mo Dipalong, Bonetetshing, Kitsokwalo/Puo le Dikgonotshelo go simolola ka Mophato R go fitlha ka Mophato 12. SDU e neelana ka thuto ka boithutedi jwa borutabana le dithutokhutshwe tse di dumeletsweng tsa UCT, tiro ya kwa sekolong, tlhagiso ya dibukana le dipatlisiso go tshegetsa go ruta le go ithuta mo makaelong otlhe a Aforikaborwa.

DITEBOGO

Ditebogo di lebiswa segolobogolo go:

- Batlhankedi ba Lefapha la Thuto la Gauteng mo Lephatheng la Kharikhulamo, Bokaedi jwa Thuto ya Barutabana le Thuto e e Kgethegileng ka ntlha ya seabe sa bona go dirisa dibukana tseno tsa rona.
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Porojeke ya Lenaneotokafatso la Dipalo tsa Mophato R le tserwe go tswa mo *R-Maths*, e phasaladitswe lwantlha ka 2017 ke Schools Development Unit, ya University of Cape Town. Tetlokhopi ya *R-Maths* e tshwerwe ke University of Cape Town.

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Overview

Purpose

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

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

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

Learning outcomes

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

Workshop content

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

Thadiso

Maitlhommo

Eno ke thutano ya borobongwe ya dithutano di le lesomepedi tsa Lenaneotokafatso la Dipalo tsa Mophato R, le e leng karolo ya Porojeke ya Lenaneotokafatso la Dipalo le Puo tsa Mophato wa R la Lefapha la Thuto la Gauteng (GDE).

Maitlhommo a thutano eno ke go thusa barutabana go diragatsa Lenaneo la Dipalo mo diphaposiborutelong tsa bona. Batsayakarolo ba tlaa nna le tšhono ya go sedisisa ya tiragatso ya bona ya Lenaneo la Dipalo le go buisana ka ga thulaganyo ya bona, go tuta le tlhatlhobo. Gape ba tlaa ela tlhoko tswelelopele ya barutwana, le ditlhokego tsa kgolo le tsa go ithuta tsa motho ka esi. Thutano e sedisisa diteng tsa Kgweditharo 3 Dibeke 7–10 le tiragatso ya tsona mo phaposiborutelong.

Metswedi ya Dikaroloteng tsa Dipalo tsa Mophato wa R di tserwe go tswa mo *Polelong ya Pholisi ya Kharikhulamo le Tlhatlhobo (PPKT): Dipalo tsa Mophato wa R (Lokwalo lwa Bofelo)*, 2011, Lefapha la Thutotheo, Aforika Borwa.

Dipoelothuto

- ◆ Go sedisisa mo tiragatsong ya Kgweditharo 3 Dibeke 4–6
- ◆ Go sedisisa ditogamaano tse di ikaegileng ka metshameko go tshegetsa go ruta dipalo mo Mophatong wa R
- ◆ Go tiisa go thaloganya ga mogopolo wa dipalo mo karoloteng ya Dinomore, Ditiro le Dikamano le go e golaganya le tiragatso ya dipalo mo phaposiborutelong ya dipalo tsa Mophato R
- ◆ Go tiisa go thaloganya tlhatlhobo e e maleba mo Mophatong wa R
- ◆ Go sedisisa dikgwetlho le go batla ditharabololo tsa go diragatsa Lenaneo la Dipalo
- ◆ Go rulaganya diteng tsa Lenaneo la Dipalo tse di tshwanetseng go rutiwa mo Kgweditharong 3 Dibeke 7–10

Diteng tsa thutano

- ◆ Pulo le tshedisiso (Ura e le 1)
- ◆ Karolo 1: Dinomore, Ditiro le Dikamano (Ura e le 1)

TEE

- ◆ Karolo 2: Dinomore, Ditiro le Dikamano (tsweletso) (Ura e le 1)
- ◆ Karolo 3: Palelo mo Mophatong wa R (Ura e le 1)

DIJOTSHEGARE

- ◆ Karolo 4: Go ithulaganyetsa go ruta (Diura di le 1½)
- ◆ Ditirwana tsa tswalelo (Metsotso e le 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

Ipaakanyo

- ◆ PPT kamogelo le dipolelo
- ◆ Itlwaetse ditlhagiso tsa PowerPoint le divideo
- ◆ Buisa:
 - Kaedi ya Mogopolo*, ditsebe 138–161
 - Kaedi ya Ditirwana: Kgweditharo 3*, ditsebe 120–185
- ◆ Tlaya ka lebokosoposo
- ◆ Gopotsa batsayakarolo go tla ka ditlabakelo tse di latelang tsa bona:
 - Kaedi ya Mogopolo*
 - Kaedi ya Ditirwana: Kgweditharo 2*
 - Kaedi ya Ditirwana: Kgweditharo 3*
 - Buka ya Diphousetara*
- ◆ Kwala dipolelo tse di latelang mo dikgemetšhaneng tse nne tse dikgolo tsa pampiri:
 - Ke ithutile ...
 - Ga ke a rata ...
 - Jaanong ke a tlhaloganya ...
 - Ke sa ntse ke sa tlhaloganye ...
- ◆ Segolola sekgemetšhana sa pampiri ya A4 sa sethlopha se sengwe le se sengwe.

Didiriswa

- ◆ Pampiri ya tšhatephetogi, dikhokhi
- ◆ Sekgomaretsi
- ◆ *Kgetsana ya Didiriswa* ya sethlopha se sengwe le se sengwe

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.

Tshedisiso e akaretsa go akanya le go bua ka ga maitemogelo a gago le se o se ithutileng. Ela tlhoko dithutano tsa Dipalo tse o di tsenetseng mme o feleletse dipolelo tse mofatlhosi o di supang.

Dintlha tsa mofatlhosi

- ◆ PPT: Dipoelothuto tsa thutano.
- ◆ Baya dikgemetšhana tsa dipolelo mo loboteng:
 - Ke ithutile ...
 - Ga ke a rata ...
 - Jaanong ke a tlhologanya ...
 - Ke sa ntse ke sa tlhologanye ...
- ◆ Baya dikgemetšhana tsa pampiri ya A4 mo tafoleng. A batsayakarolo ba kwale ditsibogo tsa bona tsa dikgemetšhana tsa pampiri mo dikgemetšhaneng tsa pampiri. A ba dirisa sekgomaretsi go bontsha dikgemetšhana tsa bona mo tlase ga polelo e e maleba.
- ◆ Buisanang ka ga ditshwaelo tsa lebokosoposo le ditlamorago tse di tswang mo thutanong e e fetileng. Gopotsa batsayakarolo go 'posa' ditshwaelo dingwe le dingwe tse dišwa le ditlamorago ka nako ya thutano.

Tshedisiso mo tiragatsong

Dintlha tsa mofatlhosi

- ◆ Gopotsa batsayakarolo ka ga *Tirwana e o e busetsang kwa sekolong* go tswa kwa bokhutlong jwa Thutano 8.
- ◆ Kopa batsayakarolo go lebelela **Tirwana 1** le **2** le go buisa ditaello. A batsayakarolo ba dire ditirwana mo ditlhopheng tsa bona. Jaanong a ditlhopha di arogane dintlhakgolo le setlhopha se segolo.
- ◆ Morago ga dipuisano tsa ditlhopha tse dinnye, tsaya ditshwaelo go tswa mo setlhopheng se sengwe le se sengwe. Khutshwafatsa katlego le dikgwetlho mme lo buisane ka ga ditlamorago mo tiragatsong yam o phaposiborutelong.

Tirwana e o e busetsang kwa sekolong go tswa mo Thutanong ya 8, e ne e tlhoka gore o dire tse di latelang:

- ◆ Dirisa *Kaedi ya Ditirwana: Kgweditharo 3* go rulaganya le go diragatsa Kgweditharo 3 Dibeke 4–6 tsa Lenaneo la Dipalo.
- ◆ Kwala ditshwaelo mo bukeng tse o di dirisang go ela tlhoko tswelolepele ya morutwana (buka ya ngwana ya kelotlhoko), mme o dirise lenanekelotlhoko la '**Ela tlhoko gore barutwana ba kgona go**' ka nako ya ditirwana tse dingwe le tse dingwe tse di kaelwang ke morutabana go kaela dikelotlhoko le ditshwaelo tsa gago.
- ◆ Kwala dintlha tsa se se dirileng sentle thata, se se sa dirang sentle le gore ba rarabolotse jang dikgwetlho dingwe ka nako ya tiragatso ya Kgweditharo 3 Dibeke 4–6.

Mo ditirwaneng tse di latelang, dirisa buka ya gago ya go ela barutwana tlhoko le dintlha tse o di kwadileng fa o ne o sedisisa ka ga thuto ya letsatsi lengwe le lengwe.



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.



Tirwana 1

1. Mo setlhopheng sa gago, aroganang katlego le dikgwetlho tsa lona mo go diragatseng Lenaneo la Dipalo mo Kgweditharong ya 3 Dibeke 4-6. Go lepalepana le dikgwetlho tse o di lemogileng, aroganang malepa a go tokafatsa go ruta le go ithuta.

2. Buisanang ka ga tiriso ya lona mo lenaneng la kelotlhoko la **'Ela tlhoko gore barutwana ba kgona go'** (mo lebokosong la leitlho) ka nako ya ditirwana tse dingwe le tse dingwe tse di kaelwang ke morutabana. Bontsha ditokololo tsa setlhopha sa gago buka ya gago ya go ela barutwana tlhoko. Tlhopha morutwana a le mongwe mme lo buisane ka ga tse o di etseng tlhoko tebang le tswelelopele ya gagwe.

3. Kwala dintlhakgolo tsa dipuisano tsa lona mo pampiring ya tšhatephetogi. Begelang setlhopha se segolo ka ga dipuisano tsa lona.



Video 1

Kaedi ya Ditirwana: Kgweditharo 3, Beke 6, Tirwana e e kaelwang ke morutabana (ditsebe 114–117)

Lebelela video ya morutabana a dira le setlhopha se sennye sa barutwana ka nako ya tirwana e e kaelwang ke morutabana mo Kgweditharong ya 3 Beke 6. Kelotlhoko ya rona mo thutanong eno e tobile ka moo morutabana o tsereganyang ka teng mo ditirwaneng tsa dinomore.

Ela tlhoko ka moo morutabana o dirang ka teng mo ditirwaneng tse thataro. Ela tlhoko:

- ◆ gore o botsa dipotso jang
- ◆ puo e o e dirisang fa a botsa dipotso
- ◆ gore o rulaganyetsa jang tirwana e nngwe le e nngwe
- ◆ dipotso tse o di botsang go kaela barutwana.



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.



Tirwana 2

Lebelela tirwana e e kaelwang ke morutabana (ditsebe 114–117) mo Bekeng 6 ya *Kaedi ya Ditirwana: Kgweditharo 3*.

1. Buisanang mokgwa o lo neng lwa tsamaisa tirwana eno e e kaelwang ke morutabana le phaposiborutelo ya gago.

2. A o ne o lebanwe ke dikgwetlho dingwe? Fa go le jalo, o di rarabolotse jang?

Dintlha tsa mofatlhosi

Bontsha barutwana video mme o etelele puisano e e ikaegileng ka ditirwana tsa dipalo le dipotso pele. Fa batsayakarolo ba sa umake dintlha tse di latelang, di tsenyeletse mo puisanong.

- ◆ Ditirwana di dikhutshwane. Morutabana ga a kaile kaile go sa tlhokege fa a neelana ka didiriswa kgotsa a bua le mongwe wa barutwana sebaka se seleele. Diphetogo di diragala ka bonako mme e bile morutabana o tsamaisa ditirwana tse thataro mo nakong e e neetsweng.
- ◆ Dipotso tsothe tse di boditsweng le puo e e dirisitsweng di a utlwala e bile di dikhutshwane.
- ◆ Ditirwana di agelela mo kitsong e e fetileng le go atolosa dikakanyo tse dišwa.
- ◆ Go reetsa le go ela tlhoko morutwana **mongwe le mongwe** go neela ka tshedimosetso ka ga tswelelopele ya bona. Go go thusa go tlaola bokgoni jwa bona le dikgala mo dikgonong kgotsa/le go tlhaloganya ga bona.

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 1: Dinomore, Ditiro le Dikamano

Ura e le 1

Mo dithutanong tse di fetileng, re buisane ka Dikaroloteng tsa Dinomore, Ditiro le Dikamano. Mo karolong eno, re tlaa lebelela ditlhogo tse di farologaneng tsa dipalo gape le go atolosa puisano ya rona go tshaloganya mogopolopalo. Re tlaa tlhotlhomisa dikarolwana tse di latelang tsa dinomore le go di golaganya le tiragatso ya phaposiborutelo:

- ◆ go balela kwa godimo
- ◆ go sekena
- ◆ go tshwantsha nomore
- ◆ go bala dilo
- ◆ dipalokemotatelano
- ◆ palelo.

Go balela kwa godimo

Dintlha tsa mofathosi

- ◆ Go balela kwa godimo go akaretsa go bua mainapalo ka thualaganyo ya tatelano. Barutwana ba latedisanya dinomore ka nako ya moetlo wa ditirwana tsa go balela kwa godimo le ka nako ya diphetogo. Dipina, merumo le ditiragatso di dira gore go balela kwa godimo go itumedise ntswa ba ntse ba ntse ba ithuta tatelano ya dinomore. Fela fa barutwana ba ka boeletsa tatelano ya dinomore ka tatelano e e nepagetseng ya go bala, ba simolola go bua ka ga kamano magareng ga dinomore, sk. ke nomore efe e e tlang pele, e e magareng kgotsa e e tlang morago ga e nngwe.
- ◆ Tlhopha sethlopha se le sengwe go tlhagisa puisano ya bona ya **Tirwana 3**.

Bana ba ithuta thulaganyo e e nepagetseng ya mainapalo fa ba tshameka, ba opela le go boeletsa merumo.

Jaaka re itse, go balela kwa godimo go akaretsa go bua mainapalo ka tatelano.

Barutwana ba tlhomaganya dinomore ka nako ya moetlo wa ditirwana tsa go balela kwa godimo le ka nako ya diphetogo. Dipina, merumo le ditiragatso di dira gore go balela kwa godimo go itumedise, fela go lebeleletse tatelano ya dinomore. Fela fa barutwana ba ka boeletsa tatelano ya dinomore ka tatelano e e nepagetseng ya go bala, ba simolola go bua ka ga kamano magareng ga dinomore, sk. ke nomore efe e e tlang *pele*, e e *magareng* kgotsa e e *tlang morago* ga e nngwe.



Tirwana 3

Mo sethlopheng sa gago, buisanang ka moo ditirwana tse di latelang di rotloeditseng go ithuta tatedisano ya mafoko a go bala mo phaposiborutelong ya gago:

- ◆ dipina le merumo
- ◆ mogala wa dinomore
- ◆ mela ya go tlola.

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.

Dintlha tsa mofatlhosi

- ◆ PPT: 'Dikao' tse di farologaneng tsa nomore le mefuta e e farologaneng ya dinomore.
- ◆ Buisanang ka ga 'dikao' tse di farologaneng tsa nomore le mefuta e e farologaneng ya dinomore, le se nomore e se tobileng mo Mophatong wa R.



Tirwana 4

Buisa tshedimosetso mo ditsebeng 138–143 mme o lebelele sethalo se se kwa godimo ga ditsebe 144–145 tsa *Kaedi ya Mogopolo*.

Mo sethopheng sa gago, buisanang ka ga dikarolwana tse di latelang tsa nomore:

- ◆ 'dikao' tse di farologaneng tsa nomore

- ◆ mefuta e e farologaneng ya dinomore

Barutwana ba Mophato R ba dira thata ka dipalotlalo 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 le 10. (Mo Mophatong wa R seno se atoloseditswe kwa go 20 le go feta.) Re tota go bala le go tshwantsha nomore ka ditsela tse di farologaneng le go neela barutwana ditšhono go dira ka dinomore mo makaelong a a farologaneng.

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?

Go sekena

Dintlha tsa mofatlhosi

- ◆ Dirisa dikarataronho go tswa mo *Kgetsaneng ya Didiriswa*.
- ◆ Kopa batsayakarolo go go bolelela gore ba bona 'di le kae' fa o kgantsha karata e nngwe le e nngwe ka bonako:
 - Bontsha karata e e nang le maronho a 3.
 - Bontsha karata e e nang le maronho a 2.
 - Tshwara dikarata tse di fa godimo di bapile.
- ◆ Tlhalosa gore go sekena ke eng (*Kaedi ya Mogopolo* ditsebe 144–147) mme o tlhalosa gore kgono eno e ungwela bana jang fa ba ithuta ka ga nomore:
 - Barutwana ba golaganya mainapalo le dilo tse dinnye tse di kokoantsweng.
 - Barutwana ba lemoga palogotlhe mo kokoanyong (go fitlhelela ka tlhano) kwa ntle ga go bala.
 - Barutwana ba simolola go lemoga gore, sekao, 'tlhano le nngwe ke thataro'.
 - Go aga tlhaloganyo ya dipalo.
 - Barutwana ba tlhaloganyo gore nomore e ka tlhatlhamololwa le go agiwa. (Kopano eno ya dinomore e ala motheo wa ditshwaraganyo.)
 - E aga go tshwarelela ka tlhogo le go itlhagisa ga dintlha tsa dipalo.
- ◆ Buisanang ka ga ditirwana tsa phaposiborutelo tse di gatelelang go sekena. Tseno di akaretsa:
 - ditirwana tsa dikarataronho
 - dibaga tsa dikago
 - motshameko wa letaese
 - didomino
 - ditirwana tsa tshikhinya le go thuba.



Tirwana 5

Ela mofatlhosi tlhoko. Nako le nako fa a kgantsha karata, bua gore o bona maronho 'a le kae' ka bonako jo o ka bo kgonang.

1. A o badile maronho ka bongwe le ka bongwe? Goreng o sa dira jalo?

2. O akanya gore botlhokwa jwa go gatelela kgono ya go sekena ke eng?

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. O dirisitse ditirwana dife tse di gatelelang bokgoni jwa go sekena mo karolong ya gago ya dipalo mo Kgweditarong 1 le 2?

Lebelela ditsebe 144–147 tsa *Kaedi ya Mogopolo*.

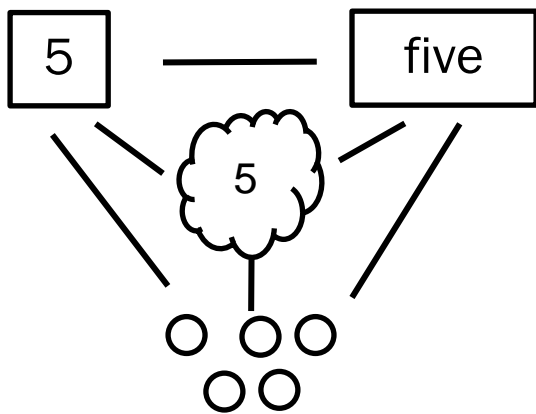
Go tshwantsha dinomore

Dintlha tsa mofatlhosi

- ◆ PPT: Tlhagiso ya sethalo mo karolong eno e e bontshang kgolagano magareng ga nomore le ditshwantsho tsa yona tse di farologaneng.
- ◆ Tlhalosa mogopolo wa nomore jaaka go tlhagisitswe ka botlalo fa tlase.
- ◆ Tlhalosa gore barutwana ba tlhoka go tlhaloganya karolwana e nngwe le e nngwe gore ba kgone go lemoga ka moo di kopanang ka teng.
 1. '5' e e mo gare ga sethalo ke nomore 5, mme seno ke kakanyo e e sa tshwarengeng.
 2. Barutwana ba tshwanetse go kgona go tshwantsha mogopolo wa 5 jaaka se se kokoantsweng, ka go dirisa malepa a a tshwaregang, jaaka dibadi, go tshwantsha nomore 5.
 3. Jaanong barutwana ba tlhoka go ithuta gore '5' e ka kwalwa jaaka letshwao le gore letshwao 5 le lona le tshwantsha kokoano (ya dibadi).
 4. Jaanong barutwana ba tlhoka go ithuta lefokopalo 'tlhano' le ka kwalwa go tshwantsha letshwao le sekokoanngwa.
 5. La bofelo, barutwana ba tlhoka go dira kgolagano magareng ga ditshwantsho tse di farologaneng tsa tlhano gore ba tlhaloganye mogopolo ka botlalo.

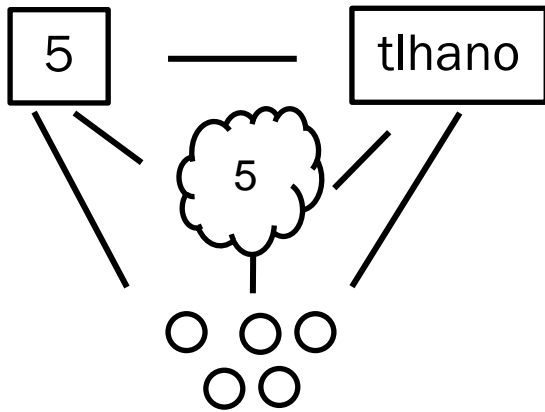
Nomore ke mogopolo o o sa tshwarengeng. Ke kakanyo e e leng mo tlhogong ya gago. Ga re ka ke ra bona dinomore, ka jalo re tlhoka go batla ditsela tse di farologaneng go tshwantsha (bontsha) nomore e e kaiwang. Barutwana ba tlhoka go dira kgolagano magareng ga kakanyo ya nomore, sk. 5, le ditshwantsho tsa yona tse di farologaneng, jaaka kokoanyo ya dilo, letshwao, lefoko. Gape ba tlhoka go tlhaloganya gore fa re re, 'tse kae' dimonamone, kopodiatla, dintlo, malatsi a botsalo, j.j., tlhano ka gale o kaya palo e e tshwanang ya dilo tseno.

Barutwana ba tlhoka go tshwarelela 'bobokae' kgotsa palo ya nomore. Go tshaeletsa mogopolo ono kwa baneng, barutabana ba tlhoka go ba tlhagisetsa kakanyo eno ka go dirisa dilo tse di tshwaregang, sekao, dibadi. Go thusa barutwana go tlhaloganya mogopolo wa nomore, ba tlhoka go lemoga gore dinomore di ka tshwantshannngwa ka ditsela tse di farologaneng. Gape barutwana ba tlhoka go dira kgolagano magareng ga ditshwantshiso tse di farologaneng tsa nomore, sekao, selo, setshwantsho, letshwao le lefoko.



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.



Dintlha tsa mofatlhosi

- ◆ Buisanang ka moo kakanyo ya ditshwantsho tse dintsinyana di tshwaelang ka teng mo tseleng ya go tlhagisa nomore ka kanelo mo Lenaneong la Dipalo.
- ◆ Gopotsa batsayakarolo ka moetlo o o dirisitsweng go ruta nomore e nngwe le e nngwe:
 - Nomorekgabisi le kanelo: aga ntlo ka go bontsha se/ditshwantsho, nomore ya ntlo, di/nakana ya lebati le lefokopalo.
 - Go nyalanya dilo, matshwaopalo, mafokopalo le dikaratarontho.

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 2: Dinomore, Ditiro le Dikamano (tsweletso)

Ura e le 1

Dilo tsa go bala

Dintlha tsa mofatlhosi

- ◆ Letla gore karolo eno ya Karolo 2 e tseye metsotso e le 40.
- ◆ PPT: Khutshwafatsa melawana ya go bala (*Kaedi ya Mogopolo* tsebe 148–149). Di tthagise ka bongwe ka bongwe. Melawana eno ya go bala ke motheo wa go ithuta go bala. Fa barutwana ba ka diragatsa melawana eno, re ka re ba kgona go bala. Gatelela gore barutwana ba tlhoka go kgona go ka diragatsa melawana yotlhe e metlhano ya go bala pele ga re ka re ba kgona go bala.
- ◆ Kopa batsayakarolo go dirisa didiriswa tse di mo tafoleng go supa go tthaloganyana molawana o mongwe le o mongwe wa go bala.
- ◆ Go tsolotanya, supa molawana o mongwe le o mongwe mo setlhopheng sotlhe.
- ◆ Buisanang ka ga ditirwana tsa letsatsi le letsatsi tsa phaposiborutelo tse di gatelelang go bala dilo tse batsayakarolo ba di dirileng mo Kgweditarong ya 1 le ya 2.
- ◆ Buisa lebokoso la 'Ka go ikatisa' mo tsebeng ya 151 ya *Kaedi ya Mogopolo* go tthalosa gore barutwana ba tswela jang fa ba ntse ba ithuta go bala le go kopanya ditlhopho tsa dilo.

Go bala '**di le kae**', barutwana ba tlhoka go lemoga gore selo se sengwe le se sengwe mo setlhopheng se na le leina la palo le gore o bala selo se sengwe le se sengwe gangwe fela.

Go na le melawana e le metlhano ya go bala e e tthalosang tsela ya go ithuta go bala. Fa barutwana ba tthalogantse mme e bile ba kgona go diragatsa melawana yotlhe e metlhano eno ya go bala, re kgona go re ba kgona go bala.



Tirwana 6

Buisa tshedimosetso mo ditsebeng tsa 148–151 tsa *Kaedi ya Mogopolo*.

1. Dirisa didiriswa tse di neetsweng go diragatsa melawana eno jaaka e tthalosiwa mo *Kaeding ya Mogopolo*.
2. Buisanang ka ga molawana o mongwe le o mongwe mo setlhopheng sa gago mme o kwale dintlha tsa gago mo papetleng e e fa tlase go tthalosa ka moo o tthaloganyang molawana o mongwe le o mongwe.

Molawana wa tsamaelano ya nngwe ka nngwe	
Molawana wa thulaganyo e e tlhomameng	

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.

Molawana wa khadinale	
Molawana wa maitlhommo	
Molawana wa tatelano e e sa tsepamang	

Dipalokemotatelano

Re buisane ka ga mefuta ya dinomore tse di go bolelelang go re 'di le kae'. Tseno di bidiwa **dipalokhadinale**.

Gape go na le dinomore tse di bontshang maemo a sengwe kgotsa mongwe mo motseletseng kgotsa mo tatelanong. Tseno di bidiwa **dipalokemotatelano**.

Dintlha tsa mofatlhosi

- ◆ Letla gore karolo eno ya Karolo 2 e tseye metsotso e le 20.
 - ◆ Batsayakarolo ba tlhopha dibalaphologolo di le thataro go tswa mo *Kgetsaneng ya Didiriswa* le go di rulaganya mo moleng, di lebeletse kwa molemeng.
 - ◆ Botsa dipotso tseno:
 - Phologolo ya ntlha ke efe?
 - Phologolo ya bobedi ke efe?
 - Koko e mo maemong afe?
 - Go latela phologolo efe?
 - Mmala wa phologolo ya boraro ke ofe?
- Ela tlhoko: Batsayakarolo ba tlaa nna le thulaganyo e e farologaneng ya diphologolo, gape ba letle go neela dikarabo go ya ka tatelano ya diphologolo mo thulaganyong ya bona.
- ◆ Kopa batsayakarolo go retolola diphologolo gore di lebelele kwa mojeng.
 - ◆ Boeletsa dipotso tse di fa godimo.
 - ◆ Buisanang gore dipalokemotatelano di ka ikatisediwa jang ka nako ya meetlo le ditirwana tsa letsatsi le letsatsi, sk., fa o le mo moleng kgotsa fa lo gaisana ka ga motshameko wa lebelo kwa ntle.
 - ◆ Lebelela mogala wa dinomore. Botsa gore ke nomore efe e e leng ya *ntlha, ya bobedi, e e bapileng le, ya pele*.



Tirwana 7

Rulaganya dibalaphologolo mo tafoleng ya gago go latela ditaello tsa mofatlhosi. Araba dipotso tsa gagwe tebang le maemo a dibalaphologolo.

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.

Dintlha tsa mofatlhosi

- ◆ Buisanang ka ga palelo mo Mophatong wa R ka go khutshwafatsa mokwalo o o fa tlase.
- ◆ **Tirwana 8:** Neela setlhopha se sengwe le se sengwe se sennye mofuta wa sediriswa:
 - dibadi
 - dibaga tsa dikago
 - dikaratarontho
 - dibolokokgogediEla tlhoko: O tlaa nna le setlhopha se se fetang bongwe se na le didiriswa tse di tshwanang.
- ◆ Morago ga gore setlhopha se sengwe le se sengwe se diragatse, buisanang ka ga ditsela tse di farologaneng tse barutwana ba lemogang dikopanyo tsa dinomore ka go aga le go tthatlhomolola dinomore.
- ◆ Supa gore go tthaloganya dinomore tse di fetang 5 go ikaegile ka megopolopalo e e ithutetsweng dinomore tsa 5 le tse di kwa tlase. Sedisisa ka moo Kgweditharo 1 le 2 di neetseng maitemogelo a go ithuta ka ga dinomore 1–5. Seno se aga motheo wa go tthaloganya dinomore tse di fetang 5.

Barutwana ba tlhoka go tthaloganya botlhokwa jwa dinomore le ka mokgwa o di amanang ka teng pele ga ba ka dira ditiro tse di etsang tlhakanyo le ntsho. Ba tshwanetse go itse, sekao, 'go na le di le kae' tharo ke; 3 e tla pele ga 4, morago ga 2 le magareng ga 2 le 4; mme e bile 3 e feta 2 ka nngwe mme gape e nnye mo go 4 ka nngwe.

Go dira ka dibadi, dibaga tsa dikago, dikaratarontho, le motshameko wa tshikhinya le go thuba go tlamela barutwana ka ditšhono tsa go tthaloganya gore dinomore di ka agiwa kgotsa di ka tthatlhamololwa. Ka tsela eno, ka iketlo ba lemoga gore nomore nngwe le nngwe e dirilwe ka kopakopano ya dinomore tse dingwe tse di farologaneng. Sekao, nomore 5 e ka dirwa ka:

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

Mo Mophatong wa R, barutwana ba lekeletsa ditsela tse di farologaneng tsa go aga le go tthatlhamolola dinomore, le go tlhakanya mmogo le go ntsha ka go dirisa dibadi.



Tirwana 8

Buisa tshedimosetso mo ditsebeng tsa 154–156 tsa *Kaedi ya Mogopolo*.

Akanya ka mokgwa o o dirisitseng didiriswa tse di neetsweng mo Lenaneong la Dipalo go thusa barutwana go tthaloganya ka moo dinomore di dirang ka teng (dipalelo) le dikamano. Dirisa didiriswa go bontsha seno.

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. Barutwana ba lekeletsa jang mogopolo wa dipalo mo Lenaneong la Dipalo ka go dirisa didiriswa tse ba di neetsweng?
2. O ne o ka botsa dipotso dife tse di ka kaelang go ithuta ga bona? (Lebelela tsebe 157 ya *Kaedi ya Mogopolo* go bona dikao tsa dipotso.)

Baakanyetsa go tthagisa puisano ya gago le sethopho sotlhe.

Dipalofoko

Dintlha tsa mofatlhosi

- ◆ Ka bokhutshwane akanya ka ga dipalofoko le dipotso tse di buisanetsweng mo Thutanong ya 6. Tlhalosa gore fa re bua ka ga dipalofoko, ga re bue ka ga dipotso tse di bulegileng. Dipalofoko kgotsa 'dikanelo tsa dipalo' ke maemo/makaelo a a tlhokang gore barutwana ba Mophato R ba dirise tlhakanyo, ntsho, le malepa a karogano le go kokoanya ka ditlhopho.
- ◆ Mo setlhopheng sa gago, a batsayakarolo ba rarabolole dipalofoko mo **Tirwaneng ya 9**.
- ◆ Buisanelang ditsibogo tsa bona fa ba tsibogela dipotso tsa palofoko e nngwe le e nngwe.
- ◆ Gopotsa batsayakarolo gore puo e e dirisitsweng e tshwanetse go nna e e bonolo e e utlwalang. Tlhakatlhakano le bofitlha jo bo itemogelwang ke barutwana fa ba rarabolola dipalo go le gantsi ke ditlamorago tsa popegopuo e e dirisiwang go tlhalosa palo, e seng go sa tlhaloganye dipalo.

Barutwana ba Mophato R ba tlhoka go rarabolola dipalo tse di akaretsang go tlhakanya, go ntsha, le go arogana ka go lekana le go kokoanya ba buela kwa godimo. Gape ba tlhoka go tlhalosa peo ya bona ya mabaka le ditsela tse ba rarabololang dipalo ka yona.

Neela barutwana nako e e motlele ya go akanya mme o ba letle go dirisa dilo tsa leruri (sk. dibadi, menwana, dibaga tsa dikago) tharabololo ya dipalo le go lekola dikarabo tsa bona.

Fa o tthagisetsa barutwana palofoko, go botlhokwa go ba rotloetsa go:

- ◆ batla malepa a go e rarabolola
- ◆ tlhalosa gore ba rarabolotse palo jang
- ◆ bua gore ke ka ntlha yang ba akanya gore karabo ya bona e nepagetse.

Makaelo a a tlwaelegileng a go tlhakanya le go ntsha a ka tthagisiwa jaaka dipalofoko. Tsela eo palo e agegileng ka yona, e na le seabe mo go reng go e rarabolola go bonolo kgotsa go boima go le kana kang. Go botlhokwa go dirisa puo e e bonolo e e utlwalang fa o tthagisa dipalofoko.

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:

Mo Thutanong ya 6, re lebeletse bothokwa jwa go dirisa puo e e bonolo, e e utlwalang le go botsa dipotso tse di maleba ka nako ya ditirwana tsa tharabololo ya dipalo. Gape re bopile dipalo tse di diragalang mo lefatsheng ka makaelo ao barutwana ba ka ikamanyang le ona. Mo Tirwaneng ya 9, lo tlaa buisana ka ga tharabololo ya dipalo ka botlalo.



Tirwana 9

1. Lebelela dipalofoko tse di fa tlase.
 - ◆ O ne o ka rarabolola palo e nngwe le enngwe jang?
 - ◆ O akanya gore barutwana ba gago ba Mophato R ba ne ba ka rarabolola jang palo e nngwe le e nngwe?
 - ◆ Ke ka ntlha ya eng dingwe tsa dipalo di le thata go feta tse dingwe?
 - ◆ Dirisa dibadi mo papetleng ya gago go bontsha gore barutwana ba ka rarabolola jang dipalo.

Kopanya	Aroganya
Laylah o na le dimonamone di le 6. Malusi o mo neela tse dingwe gape tse 2. Laylah jaanong o na le palogotlhe ya dimonamone di le kae?	Go na le dimonamone di le 8. Laylah o ja di le 3. Malusi o saletswe ke dimonamone di le kae?
Laylah o na le dimonamone di le 5. O tlhoka di le kae gore a nne le di le 8?	Laylah o na le dimonamone di le 8. Malusi o ja tse dingwe. Go setse di le 4. Malusi o jele di le kae?
Laylah o ne a na le dimonamone. Malusi o mo neela di le 2. Jaanong o na le di le 8. Laylah o simolotse a na le di le kae kwa tshimologong?	Laylah o ne a na le dimonamone. O neetse Malusi di le 6. O setse ka di le 2. O simolotse a na le dimonamone di le kae?

2. Kwala palofoko e o ka e tlhagisetsang barutwana ba gago ba Mophato R ka nngwe le nngwe ya tse di 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.

Tlhakanyo: $4 + 5 =$

Ntsho: $7 - 3 =$

Go arogana go na le masaledi: 8 e aroganngwa magareng ga barutwana ba le 4

Go arogana le go nna le masaledi: 5 e aroganngwa magareng ga barutwana ba le 2

Dintlha tsa mofatlhosi

- ◆ PPT: Papetla ya 'kopanya' le ya 'aroganya'.
- ◆ Mo Mophatong wa R, bontsi jwa barutwana bo tlaa rarabolola dipalo ka go dirisa malepa kgotsa dithekeniki tseno:
 - go bala tsotlhe
 - go dirisa dibadi kgotsa menwana go tlhagisa dikokoanngwa tse di kopantsweng kgotsa tse di arogantsweng.Barutwana ba le mmalwa ba tlaa bala go tloga ka nomore e kgolo thata gone maemo ano a kitso ya dinomore e sa ntse e godisiwa.
- ◆ Kopa batsayakarolo go arogana dikao tsa bona le setlhopha sotlhe.

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 4: Go ithulaganyetsa go ruta

Diura di le 1½

Karolo eno ya thutano e baakanyetsa batsayakarolo go diragatsa Kgweditharo 3 Dibeke 7–10. Mo pakeng eno ya ngwaga, morutabana o tshwanetse a bo a lemogile pharologano e e itlhaotseng magareng ga maemo a tswelelopele ya barutwana. Kgweditharo 3 e agelela mo ditennyeng tsa Kgweditharo 1 le 2. Bangwe ba barutwana ba tlaa bo ba le malala a laotswe, fa ba bangwe ba tlaa tlhoka tshegetso le tsolotanyo e e rileng go tswelela pele. Go botlhokwa go ithulaganyetsa le go ipaakanyetsa pharologano eno ya bokgoni jwa barutwana go netefatsa gore diteng tsothle le dikgono tsa Dipalo tsa Mophato R di lebeleletse, le gore barutwana ba ipaakanyeditse Kgweditharo 4 sentle.

Dintlha tsa mofatlhosi

Bontsha video mme lo buisane ka ga dikgwetlho le ditšhono tsa go ruta le go ithuta ka dipharologantsho mo Mophatong wa R. Fa batsayakarolo ba sa bue sepe ka dintlha tse di latelang, di tsenyeletse mo puisanong.

- ◆ Barutwana botlhe ba ka dira tirwana e e tshwanang, fela dipotso tse di bonolo di ka bodiwa.
- ◆ Morutabana o ka neela barutwana ba ba bonya/bokoanyana kaelo le go rotloetsa barutwana ba ba gatetseng pele go buisana ka ga peomabaka ga bona.
- ◆ Barutwana ba ka bewa mo ditlhopheng go ya ka bokgoni mo ditirwaneng tse dingwe le mo ditlhopheng tse di tswakantsitsweng mo ditirwaneng tse dingwe.
- ◆ Kelotlhoko le go rekota kelotlhoko go botlhokwa. Di kgontsha morutabana go bona tswelelopele ya barutwana le go itse gore o ka ba thusa jang.

Video 2

Video 1 e tselegantswe go akaretsa morutabana a bua ka mokgwa o a laolang go ruta le go ithuta ka dipharologantsho. Le tlhatlhobo mo phaposiborutelong ya gagwe.

Lebelela video ya morutabana a bua ka mokgwa o a diranang ka teng le bokgoni jo bo farologaneng jwa barutwana mo phaposiborutelong ya gagwe. Reetsa se a se buang ka mokgwa o a rulaganyang le go laola pharologano ya maemo a bokgoni jwa barutwana le gore o ithulaganya jang e le go tshegetsa ditlhokego tsa barutwana ka nosi.

Kwala dikakanyo tsa gago tebang le go ruta le go ithuta ka dipharologantsho mo phaposiborutelong ya gago.

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?

Dintlha tsa mofatlhosi

- ◆ Tsamaya magareng ga ditlhopha fa batsayakarolo ba buisana ka ga go rulaganya le ipaakanyetso ya go ruta Kgweditharo 3 Dibeke 7–10 mo **Tirwaneng 10**. Ba thuse ka go tshikhinya ditsela tsa go fena dikgwetlho.
- ◆ Setlhopha se sengwe le se sengwe se tlhagisetsa setlhopha sotlhe dintlhakgolo tsa bona tsa puisano.



Tirwana 10

1. Mo ditlhopheng tsa lona, tlatsang dithempoleiti tsa Kgweditharo 3 Dibeke 7–10 (Mametlelelo A).
2. Setlhopha sa gago se tlaa tlhagisetsa ditlhopha tse dingwe thadiso ya puisano e lo e rulagantseng. Kwalang dintlhakgolo tsa puisano ya lona mo pampiring ya tšhatephetogi. Akaretsa dikarabo tsa dipotso tse di latelang:
 - ◆ Ke dikgwetlho dife tse o di solofetseng mo tiragatsong ya Dibeke 7–10?
 - ◆ O ka rarabolola jang e nngwe le e nngwe ya dikgwetlho tseno gore o kgone go diragatsa ka katlego?
 - ◆ Tirwana e e kaelwang ke morutabana e neelana jang ka ditšhono tsa gore morutabana a tlhatlhobe le go tshegetsatsa barutwana?
 - ◆ A ditirwana tse di ikemetseng tsa ditlhopha tse dinnye di letla ikatiso e e lekaneng ya kitso e ntšhwa le dikgono?

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.

Dintlha tsa mofatlhosi

- ◆ **Tshedisiso ya thutano:** Kopa batsayakarolo go beela thoko metsotso e le mmalwa go sedisisa letsatsi le go phetlha *Bukatiro ya Batsayakarolo*. Ba kope go kwala dipotso kgotsa ditshwaelo go arogana le setlhopha sotlhe.
Kopa batsayakarolo ka bosii go ithaopa go tsiboga le go kwala tseno mo tšhatephetoging.
- ◆ Rotloetsa batsayakarolo go tlaleletsa ditshwaelo dingwe le dingwe le ditlamorago tse di iseng di arogangwe kwa lebokosongposo.
- ◆ **Tirwana e o e busetsang kwa sekolong:** Buisa tirwana eno. Botsa gore a go na le sengwe se se sa tlhakang mme se tlhoka go tthalosiwa gape.
- ◆ **Tlhatlhobo:** Ntsha dikhophi tsa Foromo ya Tlhatlhobo ya Thutano mme o kope batsayakarolo go e tlatsa.
- ◆ **Thutano e e latelang:** Neela matlha a thutano e e latelang mme o khutlise thutano.



Tirwana 11

Tshedisiso ya thutano: Tsaya metsotso e le mmalwa go sedisisa ka ga letsatsi. Phetlha *Bukatiro ya Batsayakarolo* ya gago go ikgopotsa se se dirilweng. Kwala dikakanyo tsa gago mo fatshe.

Arogana ditshedisiso tsa gago le setlhopha se segolo.



Tirwana e o e busetsang kwa sekolong

1. Dirisa *Kaedi ya Ditirwana: Kgweditharo 3* go rulaganya le go diragatsa Kgweditharo 3 Dibeke 7–10 tsa Lenaneo la Dipalo.
2. Kwala dintlha tsa se se dirileng sentle thata, se se sa dirang sentle le gore ba rarabolotse jang dikgwetlho dingwe ka nako ya tiragatso ya Kgweditharo 3 Dibeke 7–10.
3. Kwala ditshwaelo mo bukeng tse o di dirisang go ela tlhoko tswelelopele ya morutwana (buka ya ngwana ya kelotlhoko). Dirisa lenanekelotlhoko (lebokoso la leitlho) la '**Ela tlhoko gore barutwana ba kgona go**'. Ka nako ya ditirwana tse dingwe le tse dingwe tse di kaelwang ke morutabana go kaela dikelotlhoko le ditshwaelo tsa gago.
4. Tlala ka buka ya morutwana ya kelotlhoko le dintlha tse o di kwadileng fa o sedisisa thuto ya letsatsi le lengwe le le lengwe mo thutanong e e latelang.
5. Tlala ka khophi ya Kgweditharo 3: Rekoto ya Sekai sa Ditlhatlhobotsweledi (go tswa mo *Kaeding ya Ditirwana: Kgweditharo 3*) kwa thutanong e e latelang.

Evaluation

Complete the Evaluation Form.

Tlathhobo

Tlatsa Foromo ya Tlathhobo.

APPENDIX A: TERM 3 WEEKLY PLANNING TEMPLATE

Term 3: Activity Plan: Week ____

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

MAMETLELELO A: KGWEDITHARO 3 THEMPOLEITI YA THUALAGANYO YA BEKE LE BEKE

Kgweditharo 3: Thulaganyo ya ditirwana: Beke ____

KAROLOTENG:				
SETLHOGO:				
TLHAGISA KITSO E NTŠHWA:				
IKATISE:				
Ditirwana tsa phaposiborutelo yotlhe		Tirwana e e kaelwang ke morutabana	Ditirwana tsa seteišenetiro (ditirwana tse di ikemetseng tsa setlhopha se sennye)	
Letsatsi 1			Tirwana 1	
Letsatsi 2			Tirwana 2	
Letsatsi 3			Tirwana 3	
Letsatsi 4			Tirwana 4	
Letsatsi 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				

Kgweditharo 3: Thulaganyo ya ditirwana: Beke ____

KAROLOTENG:				
SETLHOGO:				
TLHAGISA KITSO E NTŠHWA:				
IKATISE:				
Ditirwana tsa phaposiborutelo yotlhe		Tirwana e e kaelwang ke morutabana	Ditirwana tsa seteišenetiro (ditirwana tse di ikemetseng tsa setlhopha se sennye)	
Letsatsi 1			Tirwana 1	
Letsatsi 2			Tirwana 2	
Letsatsi 3			Tirwana 3	
Letsatsi 4			Tirwana 4	
Letsatsi 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				

Kgweditharo 3: Thulaganyo ya ditirwana: Beke ____

KAROLOTENG:				
SETLHOGO:				
TLHAGISA KITSO E NTŠHWA:				
IKATISE:				
Ditirwana tsa phaposiborutelo yotlhe		Tirwana e e kaelwang ke morutabana	Ditirwana tsa seteišenetiro (ditirwana tse di ikemetseng tsa setlhopha se sennye)	
Letsatsi 1			Tirwana 1	
Letsatsi 2			Tirwana 2	
Letsatsi 3			Tirwana 3	
Letsatsi 4			Tirwana 4	
Letsatsi 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				

Kgweditharo 3: Thulaganyo ya ditirwana: Beke ____

KAROLOTENG:				
SETLHOGO:				
TLHAGISA KITSO E NTŠHWA:				
IKATISE:				
Ditirwana tsa phaposiborutelo yotlhe		Tirwana e e kaelwang ke morutabana	Ditirwana tsa seteišenetiro (ditirwana tse di ikemetseng tsa setlhopha se sennye)	
Letsatsi 1			Tirwana 1	
Letsatsi 2			Tirwana 2	
Letsatsi 3			Tirwana 3	
Letsatsi 4			Tirwana 4	
Letsatsi 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 Tlhatlhobo ya Thutano 9

1. A thutano e kgonne go fitlhelela ditsholofelo tsa gago?

2. Ke eng se o se ithutileng mo thutanong eno se se go thusitseng go gaisa?

3. A go na le sengwe se o sa se ratang kgotsa se se neng se go thatafalela?

4. O ya go diragatsa jang se o se ithutileng mo phaposiborutelong ya gago ya Mophato wa R?

5. A go na le se o se tshikhinyang go ka thusa go tokafatsa dithutano tse di latelang?
