Xitsonga/English

Nongonoko wa Antswiso wa Matematiki wa Giredi ya V
Grade R Mathematics Improvement Programme

Ndzetelavutivi wa 9 ● Workshop 9
Xiletelo xa Muhumelerisi ● Facilitator's Guide

Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V i matshalatshala ya **Ndzawulo ya Dyondzo ya Gauteng (Gauteng Department of Education)** na mutirhisaninkulu wa yona, **Gauteng Education Development Trust**.

Nhluvukiso na vuhumelerisi bya swipfuno swa vuleteri na swa le kamareni ro dyondzela swa Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V swi endliwile swi koteka hi timali ta tiphurojeke to hananiwa kusuka eka **United States Agency for International Development** na **Zenex Foundation**.

Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V yi fambisiwa hi **JET Education Services** na **Schools Development Unit** ya **UCT** na **Wordworks** tanihi vatirhisani va xithekiniki.

Schools Development Unit (SDU) leyi nga eka **University of Cape Town** (UCT) i mutirhisani wa xithekiniki wa matematiki eka Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V. SDU i yuniti leyi kumekaka eka School of Education ya le UCT leyi yi kongomisaka eka nhluvukiso wa xiphurofexinali wa vadyondzisi eka Matematiki, Sayense, Litheresi/Ririmi na Swikili swa Vutomi kusuka eka Giredi ya V kufika eka Giredi ya 12. SDU yi nyika mithwaso ya vudyondzisi na tikhoso to koma ta UCT leti pfumeleriweke, ntirho lowu kumekaka exikolweni, nhluvukiso wa timatheriyali na ndzaviviso ku seketela madyondziselo na madyondzelo eka mivangu ya Afrika-Dzonga hinkwayo.

SWIKHENSO
Ku khensa ko hlawuleka eka:
- Vakulukumba va Ndzawulotsongo ya Kharikhulamu, Dyondzo ya Vadyondzisi na Dyondzo yo Hlawuleka ta Ndzawulo ya Dyondzo ya Gauteng eka vuhoxaxandla bya vona ku fambelanisa matheriyali wa hina.
- Vakulukumba na vadyondzisi va Western Cape Education Department (WCED) eka vuhoxaxandla bya vona eka nsimeko lowu humeleleke wa Grade R Mathematics Programme (R-Maths) eKapa-Vupeladyambu exikarhi ka 2016 na 2019.
- Xipano xo tsala xa *R-Maths*: Vatirhi na vatsundzuxi va SDU.

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Overview

Purpose

This is the nineth 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)

Nkatsakanyo

Xikongomelo

Lowu i wa vukaye wa khumembirhi ya miletelavutivi ya Nongonoko wa Antswiso wa Matematiki wa Giredi ya V (Nongonoko wa Matematiki), leyi yi vumbaka xiphemu xa Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V ya Ndzawulo ya Dyondzo ya Gauteng (Gauteng Department of Education) (GDE).

Xikongomelo xa ndzetelavutivi lowu i ku pfuna vadyondzisi ku tirhisa Nongonoko wa Matematiki etikamareni to dyondzela ta vona. Vatekaxiave va ta kuma xivandlanene xa ku ehleketisisa hi mayelana na ku tirhisiwa ka Nongonoko wa Matematiki kutani va kanela nkunguhato, madyondziselo na madyondzelo ya vona. Va ta tlhela va anakanya hi ku ya emahlweni ka mudyondzi, na swilaveko swa nhluvukiso na ku dyondza swa mudyondzi hi un'weun'we. Vatekaxiave va ta ehleketisisa hi mayelana na maqhinga ya makambelelo lama faneleke ya ku rhekoda ku ya emahlweni ka mudyondzi. Ndzetelavutivi lowu wu valanga vundzeni bya Mavhiki ya 7–10 ya Kotara ya 3 na ku tirhisiwa ka byona ekamareni ro dyondzela.

Mikongomiso eka Swiyenge swa Vundzeni wa Matematiki wa Giredi ya V swi tekiwa kusuka eka *Xitatimente xa Pholisi ya Kharikhulamu na Makambelelo (XIPHOKHAMA): Matematiki wa Giredi ya V (Mpfapfarhuto wo Hetelela),* 2011, Ndzawulo ya Dyondzo ya Masungulo, Afrika-Dzonga.

Mivuyelo ya dyondzo

- Ku ehleketisisa hi matirhelo ya Mavhiki ya 4–6 ya Kotara ya 3
- Ku valanga maqhinga lama simekiweke eka ntlangu ku seketela ku dyondzisa matematiki eka Giredi ya V
- Ku tiyisa ntwisiso wa nongoti wa tinomboro eka Xiyenge xa Vundzeni xa Tinomboro, Tioparexini na Vuxaka na ku xakanelanisa leswi na ku tirhisiwa ka matematiki eka kamara ro dyondzela ra Giredi ya V
- Ku tiyisa ntwisiso wa makambelelo lama faneleke eka Giredi ya V
- Ku ehleketisisa hi mitlhontlho na ku kuma swivtshunxo swa ku tirhisa Nongonoko wa Matematiki
- Ku kunguhata vundzeni bya Nongonoko wa Matematiki lebyi faneleke ku dyondzisiwa eka Mavhiki ya 7–10 ya Kotara ya 3

Vundzeni bya ndzetelavutivi

- Ku pfula na ku ehleketisisa   (1 ya awara)
- Sexini ya 1: Tinomboro, Tioparexini na Vuxaka   (1 ya awara)

TIE

- Sexini ya 2: Tinomboro, Tioparexini na Vuxaka
  (swi yisiwa emahlweni)   (1 ya awara)
  Sexini ya 3: Nkhakhuleto eka Giredi ya V   (1 ya awara)

LANCI

- Sexini ya 4: Nkunguhato wa ku dyondzisa   (1½ wa tiawara)
- Migingiriko yo pfala   (30 wa timinete)

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

Malulamiselo

- PPT ku amukela na mivuyelo
- Titolovete tiPowerPoint na tivhidiyo hinkwato
- Hlaya:
  Xiletelo xa Minongoti, tipheji ta 138–161
  Xiletelo xa Migingiriko: Kotara ya 3, tipheji ta 120–185
- Tana na bokisi ra poso
- Tsundzuxa vatekaxiave ku ta na:
  Xiletelo xa Minongoti
  Xiletelo xa Migingiriko: Kotara ya 2
  Xiletelo xa Migingiriko: Kotara ya 3
  Buku ya Tiphositara
- Tsala swivulwa leswi landzelaka eka switiripi leswikulu swa mune swa phepha:
  Ndzi dyondze ...
  A ndzi tsakelangi ...
  Sweswi ndzi twisisa ...
  A ndzi si va erivaleni hi mayelana na ...
- Tsema switiripi swa phepha ra A4 swa ntlawa wun'wana na wun'wana.

Timatheriyali

- Phepha ra chati yo pfula, tikhoki
- Prestik
- *Khiti ya Swipfuno* ya ntlawa wun'wana na wun'wana

Opening and reflection

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.

Ku pfula na ku ehleketisisa

Vuehleketisisi byi khumba ku ehleketa na ku vulavula hi mayelana na mitokoto ya wena ya leswi u swi dyondzeke. Anakanya hi miletelavutivi ya Matematiki leyi u yeke eka yona kutani u hetisa swivulwa leswi muhumelerisi a swi kombisaka.

Tinotsi ta muhumelerisi
♦ PPT: Mivuyelo ya ku dyondza ya ndzetelavutivi.

♦ Vekela switiripi swa swivulwa ekhumbini:
  - Ndzi dyondze …
  - A ndzi tsakelangi …
  - Sweswi ndzi twisisa …
  - A ndzi si va erivaleni hi mayelana na …

♦ Vekela switiripi swa phepha ra A4 etafuleni rin'wana na rin'wana. Vatekaxiave va tsala tinhlamulo ta vona ta switiripi swa swivulwa eka switiripi swa phepha ra A4. Tirhisa Prestik ku kombisa switiripi swa vona ehansi ka swivulwa leswi fambelanaka.
♦ Kanelani swibumabumelo swa bokisi ra poso na mbiko kusuka eka ndzetelavutivi wa nkarhi lowu nga hundza. Tsundzuxa vatekaxiave ku 'posa' swibumabumelo swintshwa swihi kumbe swihi na mbiko hi nkarhi wa ndzetelavutivi lowu.

Vuehleketisisi hi mayelana na matirhiselo

Tinotsi ta muhumelerisi
♦ Tsundzuxa vatekaxiave hi *Xintirhwana xo tlhelela na xona exikolweni* kusuka eka Ndzetelavutivi wa 8.
♦ Kongomisa vatekaxiave eka **Nghingiriko wa 1 na 2** kutani va hlaya swileriso. Vatekaxiave va hetisa migingiriko leyi emitlaweni ya vona. Endzhaku ka swona mitlawa yi avelana timhakakulu na ntlawa lowukulu.
♦ Endzhaku ka mikanelo ya mitlawa leyitsongo, teka swibumabumelo kusuka eka ntlawa wun'wana na wun'wana. Kombisa ku humelela na mitlhontlho kutani mi kanela leswi swi vulaka swona loko swi tirhisiwa ekamareni ro dyondzela.

Xintirhwana xo tlhelela na xona exikolweni kusuka eka Ndzetelavutivi wa 8, a xi ku lava leswaku u endla leswi landzelaka:

♦ Tirhisa *Xiletelo xa Migingiriko: Kotara ya 3* ku kunguhata na ku tirhisa Mavhiki ya 4–6 ya Kotara ya 3 ya Nongonoko wa Matematiki.

♦ Tsala swibumabumelo ebukwini leyi u tirhisaka ku landzelerisa ku ya emahlweni ka mudyondzi un'wana na un'wana (buku ya mixiyaxiyo ya vadyondzi) kutani u tirhisa nxaxamelo wa mixiyaxiyo ya '**Kamba leswaku vadyondzi va kota ku**' hi nkarhi wa wun'wana na wun'wana wa migingiriko leyi leteriwaka hi mudyondzisi ku letela mixiyaxiyo na swibumabumelo swa wena.

♦ Endla tinotsi ta leswi swi tirheke kahle swinene, leswi swi nga tirhangiki kahle swinene na hilaha u ololoxeke hakona mitlhontlho yihi kumbe yihi eka matirhiselo ya wena ya Mavhiki ya 4–6 ya Kotara ya 3.

Eka migingiriko leyi landzelaka tirhisa buku ya mixiyaxiyo ya vadyondzi ya wena na tinotsi leti u ti endleke loko u ri karhi u ehleketisisa hi mayelana na madyondziselo ya siku rin'wana na rin'wana.

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.

_____
_____
_____
_____

🎎 Nghingiriko wa 1

1. Entlaweni wa n'wina, avelanani ku humelela ka n'wina na mitlhontlho ya n'wina hi ku tirhisa Nongonoko wa Matematiki lowu nga eka Kotara ya 3 ya Mavhiki ya 4–6. Avelanani maqhinga ya ku antswisa madyondziselo na madyondzelo ya mitlhontlho leyi mi yi kumeke.

   _____
   _____
   _____

2. Kanelani ntirhiso wa wena wa nxaxamelo wo xiyaxiya wa '**Kamba leswaku vadyondzi va kota ku**' (ebokisini ra mahlo) hi nkarhi wa wun'wana na wun'wana wa migingiriko leyi leteriwaka hi mudyondzisi.
   Komba swirho swa ntlawa wa wena buku ya mixiyaxiyo ya vadyondzi ya wena. Hlawula mudyondzi un'we kutani u kanela mixiyaxiyo ya wena ya ku ya emahlweni ka mudyondzi loyi.

   _____
   _____
   _____
   _____
   _____
   _____

3. Tsalani timhakakulu ta nkanelo wa n'wina eka phepha ra chati yo pfula. Nyikani xiviko hi mayelana na nkanelo wa n'wina eka ntlawa lowukulu.

🎥 Vhidiyo ya 1

Hlalelani vhidiyo ya mudyondzisi a ri karhi a tirha na ntlawa lowutsongo wa vadyondzi hi nkarhi wa nghingiriko lowu leteriwaka hi mudyondzisi lowu nga eka Vhiki ra 6 ra Kotara ya 3. Nkongomo wa nxiyaxiyo wa hina eka ndzetelavutivi lowu wu le ka hilaha mudyondzisi a pfunaka hakona eka migingiriko ya tinomboro.

Xiyaxiya hilaha mudyondzisi a tirhaka hakona eka migingiriko leya tsevu. Lemuka:
♦ hilaha a vulaka swiphiqo hakona
♦ ririmi leri a ri tirhisaka loko a ri karhi a vutisa swivutiso
♦ hilaha a lulamisaka hakona nghingiriko wun'wana na wun'wana
♦ swivutiso leswi a swi vutisaka ku letela vadyondzi.

_____
_____
_____

_____
_____
_____
_____

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.

_____
_____
_____
_____
_____

Nghingiriko wa 2

Kongomisa eka nghingiriko lowu leteriwaka hi mudyondzisi eka tipheji ta 114–117 ta Vhiki ra 6 ra *Xiletelo xa Migingiriko: Kotara ya 3*.

1. Kanelani hilaha u lawuleke hakona nghingiriko lowu leteriwaka hi mudyondzisi na tlilasi ya wena.

_____
_____
_____

2. Xana u hlanganile na mitlhontlho yihi kumbe yihi? Loko swi ri tano, xana u yi ololoxile njhani?

_____
_____
_____

Tinotsi ta muhumelerisi
Komba vhidiyo leyi kutani u rhangela nkanelo hi ku ya hi migingiriko ya matematiki na swivutiso. Loko vatekaxiave va nga vuli timhakakulu leti landzelaka, ti engeteli eka nkanelo.
♦   Migingiriko leyi yi komile. Mudyondzisi a nga teki nkarhi swi nga fanelangi loko a ri karhi a phakela switirhisiwa kumbe ku vulavula na mudyondzi un'we nkarhi wo leha kutlula mpimo. Micinco i ya xihatla naswona mudyondzisi u lawula migingiriko leya tsevu hi nkarhi lowu averiweke.
♦   Havumbirhi swivutiso leswi vutisiwaka na ririmi leri tirhisiwa swi le rivaleni naswona swi komile.
♦   Migingiriko yi aka ehenhla ka vutivi bya nkarhi lowu nga hundza na ku ndlandlamukisa mianakanyo yintshwa.
♦   Ku yingisela na ku xiyaxiya mudyondzi **un'wana na un'wana** swi nyika ntwisiso eka ku ya emahlweni ka yena. Swi ku pfuna ku kuma vuswikoti bya yena na mavangwa lama nga eka xikili xa yena na/kumbe ntwisiso wa yena.

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.

Sexini ya 1: Tinomboro, Tioparexini na Vuxaka

Eka miletelavutivi ya nkarhi lowu nga hundza hi kanerile Xiyenge xa Vundzeni xa Tinomboro, Tioparexini na Vuxaka. Eka sexini leyi hi ta tlhelela eka tinhlokomhaka ta tinomboro to hambanahambana na ku ndlandlamukisa nkanelo wa hina ku twisisa ku ya emahlweni nongoti wa tinomboro. Hi ta valanga swiphemu leswi landzelaka swa nomboro kutani hi swi khomanisa na ku titoloveta eka kamara ro dyondzela:

♦ ku hlayela ka swanomu
♦ ku vhumba ntsengo
♦ ku endla vuyimeri bya nomboro
♦ tinomboro ta odinali
♦ ku khakhuleta.

Ku hlayela ka swanomu

Tinotsi ta muhumelerisi

♦ Ku hlayela ka swanomu swi khumba ku vula mavito ya tinomboro hi ku landzelelana. Vadyondzi va longoloxela tinomboro hi nkarhi wa migingiriko ya ku hlayela ka swanomu ya siku na siku na hi nkarhi ku cinca. Tinsimu, tirhayimi na swiendlo swi endla ku hlayela ka swanomu ku tsakisa loko ku ri karhi ku dyondziwa nandzelelano wa tinomboro. Xikan'wekan'we loko vadyondzi va nga kota ku vuyelela malongolokelo ya tinomboro hi nandzelelano wo hlayela lowu nga lulama, va sungula ku vulavula hi mayelana na vuxaka exikarhi ka tinomboro, xik., xana i nomboro yihi yi nga emahlweni ka, exikarhi ka kumbe endzhaku ka nomboro yin'wana.
♦ Hlawula ntlawa wun'we ku andlala nkanelo wa vona wa **Nghingiriko wa 3**.

Vana va dyondza nandzelelano lowu nga lulama wa mavito ya tinomboro loko va ri karhi va tlanga, va yimbelela na ku vuyelela tirhayimi.

Tanihilaha hi swi tivaka hakona, ku hlayela ka swanomu swi khumba ku vula mavito ya tinomboro hi ku landzelelana. Vadyondzi va longoloxela tinomboro hi nkarhi wa migingiriko ya ku hlayela ka swanomu ya siku na siku na hi nkarhi wa micinco. Tinsimu, tirhayimi na swiendlo swi endla ku hlayela ka swanomu ku tsakisa, kambe nkongomo wu le ka nandzelelano wa tinomboro. Xikan'wekan'we loko vadyondzi va kota ku vuyelela malongolokelo ya tinomboro hi nandzelelano wo hlayela lowu nga lulama, va sungula ku vulavula hi mayelana na vuxaka exikarhi ka tinomboro, xik., xana i nomboro yihi yi nga *emahlweni ka*, *exikarhi ka* kumbe *endzhaku ka* nomboro yin'wana.

 Nghingiriko wa 3

Entlaweni wa n'wina, kanelani hilaha migingiriko leyi landzelaka yi kondleteleke ku dyondziwa ka malongolokelo ya ku hlayela marito etlilasini ya wena:

♦ tinsimu na tirhayimi
♦ mugiva wa tinomboro
♦ tindlela to tlulela.

_____
_____
_____
_____
_____

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.

_____
_____
_____
_____
_____

Nghingiriko wa 4

Hlaya vuxokoxoko lebyi nga eka tipheji ta 138–143 na ku languta dayagiramu leyi nga ehenhla ka tipheji ta 144–145 ta *Xiletelo xa Minongoti*.

Entlaweni wa n'wina, kanelani swiphemu leswi landzelaka swa nomboro:

♦ 'tinhlamuselo' to hambanahambana ta nomboro

_____
_____
_____
_____

♦ mixaka yo hambanahambana ya tinomboro

_____
_____
_____
_____

Vadyondzi va le ka Giredi ya V va tirha ngopfungopfu hi tinomboroxiheri ta 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 na 10. (Eka Giredi ya 1 leti ta ndlandlamukisiwa kuya eka 20 na kuhundza.) Hi kongomisa eka ku hlayela na ku endla vuyimeri bya nomboro hi tindlela to hambanahambana na ku nyika swivandlanene eka vadyondzi ku tirhana na tinomboro eka mivangu yo hambanahambana.

Subitising

♦ 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?

_____
_____
_____
_____

Ku vhumba ntsengo

 Nghingiriko wa 5

Xiyaxiya muhumelerisi. Nkarhi wun'wana na wun'wana loko a komba khadi, vula hi xihatla hilaha u kotaka hakona leswaku i mathonsi 'mangani' u ma vonaka.

1. Xana a wu hlayela nthonsi rin'wana na rin'wana hi rin'werin'we? Hikwalahokayini swi nga ri tano?

_____
_____
_____
_____

2. Xana u ehleketa leswaku i yini mbuyelo wa ku tiyisa xikili xa ku vhumba ntsengo?

_____
_____
_____
_____

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

<table>
<tr><td>Facilitator's notes</td></tr>
<tr><td>
♦   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.
</td></tr>
</table>

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. Xana hi yihi migingiriko leyi tiyisaka vuswikoti bya ku vhumba ntsengo leyi u yi tirhiseke eka tisexini ta wena ta matematiki eka Tikotara ta 1 na 2?

_____
_____
_____
_____

Kongomisa eka tipheji ta 144–147 ta *Xiletelo xa Minongoti*.

Ku endla vuyimeri bya nomboro

Tinotsi ta muhumelerisi
♦ PPT: Mfambafambo wa tipopayi wa dayagiramu lowu nga eka xiyenge lexi lowu wu kombaka vuxakelani exikarhi ka nomboro na vuyimeri bya yona byo hambanahambana. ♦ Hlamusela nongoti wa nomboro tanihilaha swi koxometiweke hakona laha hansi. ♦ Hlamusela leswaku vadyondzi va fanele ku twisisa xiphemu xin'wana na xin'wana hi xikongomelo xa ku endla vuxaka exikarhi ka swona. 　1. '5' leyi nga exikarhi ka dayagiramu i nomboro ya 5, naswona lowu i muanakanyo wo anakanyiwa. 　2. Vadyondzi va fanele ku kota ku endla vuyimeri bya nongoti wa 5 tanihi nhlengelo, hi ku tirhisa timatheriyali to khomeka, ku fana na swihlayeri, ku endla vuyimeri bya nomboro ya 5. 　3. Endzhaku ka swona vadyondzi va fanele ku dyondza leswaku '5' yi nga tsariwa tanihi mfungho na leswaku mfungho wa 5 wu tlhela wu yimela nhlengelo (wa swihlayeri). 　4. Endzhaku ka swona vadyondzi va fanele ku dyondza leswaku vito ra nomboro ra 'ntlhanu' ri nga tsariwa ku yimela mfungho na nhlengelo. 　5. Xo hetelela, vadyondzi va fanele ku endla vuxaka exikarhi ka vuyimeri byo hambanahambana bya ntlhanu ku twisisa hi ku hetiseka nongoti lowu.

Nomboro i nongoti wo anakanyiwa. I muanakanyo lowu wu nga kona enhlokweni ya wena. Hi nge swi koti ku vona tinomboro, hikokwalaho hi boheka ku kuma tindlela to hambanahambana ku endla vuyimeri bya (komba) nomboro leyi ku kongomisiwaka eka yona. Vadyondzi va fanele ku endla vuxaka exikarhi ka muanakanyo wa nomboro, xik., 5, na vuyimeri bya yona byo hambanahambana, ku fana na nhlengelo wa michumu, mfungho, rito. Va fanele ku tlhela va twisisa leswaku loko hi vula hi ku, i swiwitsi, miphokotelo, tindlu, masiku ya ku velekiwa 'mangani', sw.sw., mikarhi hinkwayo ntlhanu yi vula nhlayo yo fana ya swilo leswi.

Vadyondzi va lava ku twisisa leswaku 'i swingani' kumbe nhlayo ya nomboro. Ku vulavurisana hi mayelana na nongoti lowu na vadyondzi, vadyondzisi va fanele ku tivisa muanakanyo lowu hi ku tirhisa michumu yo khomeka, tanihi xikombiso, swihlayeri. Ku pfuna vadyondzi ku twisisa nongoti wa nomboro, va fanele ku vona leswaku tinomboro ti nga yimeriwa hi tindlela to hambanahambana. Vadyondzi va tlhela va fanela hi ku endla vuxaka exikarhi ka vuyimeri byo hambanahambana bya nomboro, tanihi xikombiso, nchumu, xifaniso, mfungho na rito.
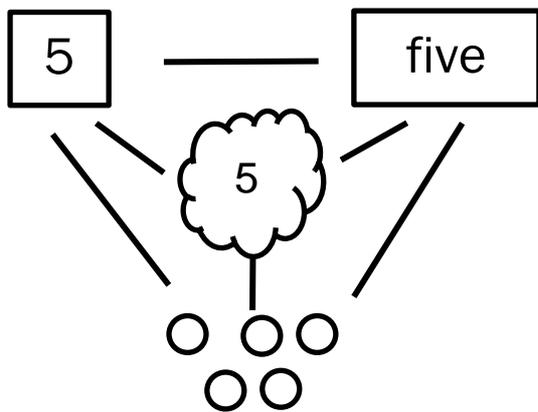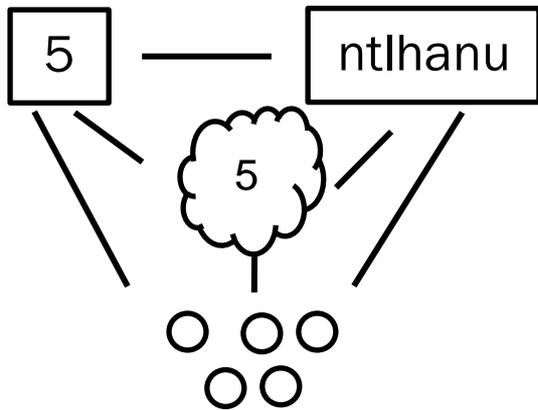
Tinotsi ta muhumelerisi
♦ Kanelani hilaha muanakanyo wa vuyimerinyingi wu letelaka hakona maendlelo ya ku tivisa nomboro hi ku tirhisa xitori eka Nongonoko wa Matematiki.

♦ Tsundzuxa vatekaxiave hi ntolovelo wa siku na siku wa ku dyondzisa nomboro yin'wana na yin'wana:
  - Xipendiwankhaviso xa tinomboro na xitori: aka yindlu hi ku komba swi/xifaniso, nomboro ya yindlu, ti/bele ya rivanti na rito ra nomboro
  - Ku pananisa michumu, mifungho ya tinomboro, marito ya tinomboro na makhadi ya mathonsi.

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	

Sexini ya 2: Tinomboro, Tioparexini na Vuxaka (swi yisiwa emahlweni)

Ku hlayela michumu

Tinotsi ta muhumelerisi
♦ Pfumelela 40 wa timinete eka xiyenge lexi xa Sexini ya 2.
♦ PPT: Nyika nkomiso wa milawu yo hlayela (*Xiletelo xa Minongoti* pheji ya 148–149). Yi andlali hi wun'we hi nkarhi. Milawu yo hlayela leyi hi wona masungulo ya ku dyondza ku hlayela. Xikan'wekan'we loko vadyondzi va kota ku tirhisa milawu leyi, hi nga vula leswaku va kota ku hlayela. Kombisa leswaku vadyondzi va fanele ku kota ku kombisa hinkwayo ntlhanu ya milawu yo hlayela hi nga si vula leswaku va kota ku hlayela.
♦ Kombela vatekaxiave ku tirhisa switirhisiwa leswi nga etafuleni ku kombisa ntwisiso wa vona wa wun'wana na wun'wana wa milawu yo hlayela.
♦ Ku tiyisa, kombisa nawu wun'wana na wun'wana eka ntlawa hinkwawo.
♦ Kanelani migingiriko ya le kamareni ro dyondzela ya siku na siku leyi yi tiyisaka ku hlayeriwa ka michumu leyi vatekaxiave va yi endleke eka Tikotara ta 1 na 2.
♦ Hlaya bokisi ra 'Eka maendlelo' leri nga eka pheji ya 151 ya *Xiletelo xa Minongoti* ku hlamusela hilaha vadyondzi va yaka emahlweni hakona loko va ri karhi va dyondza ku hlayela na ku katsa mitlawa ya michumu*.*

Ku hlayela leswaku '**i swingani**', vadyondzi va fanele ku vona leswaku nchumu wun'wana na wun'wana lowu nga entlaweni wu na vito ra nomboro na leswaku ku hlayeriwa nchumu wun'wana na wun'wana kan'we ntsena.

Ku na ntlhanu wa milawu yo hlayela leyi yi hlamuselaka hi ku hlawulekisa maendlelo ya ku dyondza ku hlayela. Xikan'wekan'we loko vadyondzi va twisisile naswona va kota ku tirhisa hinkwayo ntlhanu ya milawu yo hlayela leyi, hi kota ku vula leswaku va kota ku hlayela.

Nghingiriko wa 6

Hlaya vuxokoxoko lebyi nga eka tipheji ta 148–151 ta *Xiletelo xa Minongoti*.

1. Tirhisa switirhisiwa leswi nyikiweke ku kombisa milawu leyi tanihilaha yi hlamuseriweke hakona eka *Xiletelo xa Minongoti*.

2. Kanelani nawu wun'wana na wun'wana entlaweni wa n'wina kutani mi endla tinotsi ta n'wina vini etafuleni leri nga laha hansi ku hlamusela ntwisiso wa n'wina wa nawu wun'wana na wun'wana.

Nawu wa yelano wa xin'we-eka-xin'we	
Nawu wa nandzelelano lowu nga cincacinciki	

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**.

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.

_____
_____
_____
_____

Nawu wa masungulo	
Nawu wo anakanya	
Nawu wa nandzelelano-hambuko	

Tinomboro ta odinali

Hi kanerile mixaka ya tinomboro leti ti ku byelaka leswaku 'i swingani'. Leti ti vitaniwa **tinomboro ta masungulo**.

Ku tlhela ku va na tinomboro leti ti kombaka xiyimo xa xilo xin'wana kumbe munhu un'wana hi ntlhandlamano kumbe nandzelelano. Leti ti vitaniwa **tinomboro ta odinali**.

Tinotsi ta muhumelerisi
♦ Pfumelela 20 wa timinete eka xiyenge lexi xa Sexini ya 2.
♦ Vatekaxiave va hlawula tsevu wa swihlayeri swa swiharhi kusuka eka *Khiti ya Swipfuno* kutani va swi veketela hi ku landzelelana, swi languta eximatsini.
♦ Vutisa swivutiso leswi: - Xana i xiharhi xihi xi nga xa vun'we? - Xana i xiharhi xihi xi nga xa vumbirhi? - Xana hi kwihi laha huku yi vekiweke kona? - Xana i xiharhi xihi xi landzelaka? - Xana i yini muhlovo wa xiharhi xa vunharhi? Lemuka: Vatekaxiave va ta va na maveketelelo yo hambanahambana ya swiharhi, hikokwalaho va pfumeleli va nyika tinhlamulo hi ku ya hi nandzelelo wa swiharhi leswi nga eka maveketelelo ya vona.
♦ Kombela vatekaxiave ku hundzuluxa swiharhi leswi ku endlela leswaku swi languta exineneni.
♦ Vuyelela swivutiso leswi nga laha henhla.
♦ Kanelani hilaha tinomboro ta odinali ti nga titolovetiwaka hakona hi nkarhi wa mitolovelo na migingiriko ya siku na siku, xik., loko ku ri karhi ku foriwa tilayini kumbe loko ku ri karhi ku endliwa nsiyano wa le handle ka miako.
♦ Kongomisa eka mugiva wa tinomboro. Vutisa leswaku i nomboro yihi yi nga *ya vun'we, vumbirhi, ekusuhi na, emahlweni ka*.

Nghingiriko wa 7

Veketelani swihlayeri swa swiharhi leswi nga etafuleni ra n'wina hi ku ya hi swileriso swa muhumelerisi. Hlamulani swivutiso swa yena hi mayelana na xiyimo xa swihlayeri swa swiharhi.

_____
_____
_____
_____

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

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.

Sexini ya 3: Nkhakhuleto eka Giredi ya V

Tinotsi ta muhumelerisi

- ♦ Kanelani nkhakhuleto eka Giredi ya V hi ku nyika nkomiso wa xitsariwa lexi nga laha hansi.
- ♦ **Nghingiriko wa 8**: Nyika ntlawa lowutsongo wun'wana na wun'wana muxaka wo hambana wa switirhisiwa:
  - swihlayeri
  - vuhlalu bya swivumbeko
  - makhadi ya mathonsi
  - tibuloko ta Unifix.

  Lemuka: Mi ta va na kutlula ntlawa wun'we lowu nga na muxaka wo fana wa switirhisiwa.
- ♦ Endzhaku ka loko ntlawa wun'wana na wun'wana wu kombisile, kanelani tindlela to hambanahambana leti vadyondzi va kumisisaka hatona hi mayelana na mikatsano ya tinomboro hi ku tirhisa ku aka na ku tlhantlha tinomboro.
- ♦ Kombeta leswaku ntwisiso wa tinomboro letikulukumba kutlula 5 wu simekiwile ehenhla ka minongoti ya tinomboro leyi dyondziweke ya tinomboro ta 5 na kuya ehansi. Ehleketisisani hilaha Tikotara ta 1 na 2 ti nyikeke hakona mitokoto ya ku dyondza hi mayelana na tinomboro ta 1–5. Leswi swi vumba masungulo ya ntwisiso wa tinomboro leti nga tikulukumba eka 5.

Vadyondzi va fanele ku twisisa nkoka wa tinomboro na vuxaka exikarhi ka tona va nga si endla tioparexini to fana na ku hlanganisa na ku susa. Va fanele ku tiva, tanihi xikombiso, xana nharhu 'i tingani'; 3 yi ta emahlweni ka 4, endzhaku ka 2 na le xikarhi ka 2 na 4; naswona 3 i yikulu hi n'we eka 2 naswona i yitsongo hi n'we eka 4.

Ku tirha hi swihlayeri, vuhlalu bya swivumbeko, makhadi ya mathonsi, na ntlangu wo dludla kutani u tlhantlha swi nyika swivandlanene eka vadyondzi ku twisisa leswaku tinomboro ti nga kota ku aka ti ya ehenhla kumbe ti tlhantlhiwa. Hi ndlela leyi, katsongotsongo va lemuka leswaku nomboro yihi kumbe yihi yi vumbiwa hi mikatsano yo hambanahambana yo tala ya tinomboro tin'wana. Tanihi xikombiso, nomboro ya 5 yi nga vumbiwa hi:

- ♦ 4 na 1
- ♦ 1 na 1 na 1 na 2
- ♦ 0 na 5.

Eka Giredi ya V, vadyondzi va valanga tindlela to hambanahambana ta ku aka na ku tlhantlha tinomboro, na ku hlanganisa na ku susa hi ku tirhisa swihlayeri.

Nghingiriko wa 8

Hlaya vuxokoxoko lebyi nga eka tipheji ta 154–156 ta *Xiletelo xa Minongoti*.

Ehleketa hi mayelana na hilaha u tirhiseke hakona timatheriyali leti nyikiweke eka Nongonoko wa Matematiki ku pfuna vadyondzi ku twisisa tioparexini ta tinomboro (mikhakhuleto) na vuxaka. Tirhisa timateriyali ku kombisa leswi.

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. Xana vadyondzi va valanga njhani nongoti wa nomboro eka Nongonoko wa Matematiki hi ku tirhisa timatheriyali leti nyikiweke?

2. Xana i swivutiso swihi leswi u nga swi vutisaka leswi swi nga ta letela ku dyondza ka vona? (Kongomisa eka pheji ya 157 ya *Xiletelo xa Minongoti* ku kuma swikombiso swa swivutiso.)

_____

_____

_____

_____

Lulamiselani ku andlala nkanelo wa n'wina eka ntlawa lowukulu.

Swiphiqo swa marito

Tinotsi ta muhumelerisi
♦ Ehleketisisani hi ku komisa hi mayelana na swiphiqo swa marito na swivutiso leswi kaneriweke eka Ndzetelavutivi wa 6. Hlamusela leswaku loko hi vulavula hi mayelana na swiphiqo swa marito, a hi kongomisi eka swivutiso leswi nga na makumu yo pfuleka. Swiphiqo swa marito kumbe 'tinhlayo ta xitori' i swiyimo/mivangu leyi yi lavaka leswaku vadyondzi va le ka Giredi ya V va tirhisa maqhing ku hlanganisa, ku susa, ku avelana na ku ntlawahata.
♦ Hi mitlawa, vatekaxiave va ololoxa swiphiqo swa marito leswi nga eka **Nghingiriko wa 9**.
♦ Eka xiphiqo xa marito xin'wana na xin'wana, va kanela tinhlamulo ta vona ta swivutiso.
♦ Tsundzuxa vatekaxiave leswaku ririmi leri fanelaka ku tirhisiwa ri fanele ku olova na ku va erivaleni. Mpfilungano na ku tikeriwa loku vadyondzi va hlanganaka na kona loko va ri karhi va ololoxa swiphiqo swa marito hakanyingi swi hikwalaho ka xivumbeko xa ririmi leri tirhisiwaka ku paluxa xiphiqo, ematshan'weni ya mpfumaleko wa ntwisiso wa matematiki.

Vadyondzi va le ka Giredi ya V va fanele ku ololoxa swiphiqo swa marito hi nomu leswi swi khumbaka ku hlanganisa, ku susa, na ku avelana ko ringana na ku tlawahata. Va tlhela va fanele ku hlamusela maehleketelelo na tindlela ta vona vini ta ku ololoxa swiphiqo swo hambanahambana.

Nyika vadyondzi nkarhi wo tala ku ehleketa kutani u va tshika va tirhisa michumu ya xiviri (xik. swihlayeri, tintiho, vuhlalu bya xivumbeko) ku ololoxa swiphiqo na ku kamba tinhlamulo ta vona.

Loko u andlala xiphiqo xa marito eka vadyondzi, i swa nkoka ku va khutaza ku:
- kuma qhinga ra ku ololoxa xiphiqo lexi
- hlamusela hilaha va ololoxeke xiphiqo lexi hakona
- vula leswaku hikwalahokayini va ehleketa leswaku nhlamulo ya vona yi lulamile.

Mivangu ya ku hlanganisa na ku susa ya ntolovelo yi nga andlariwa tanihi swiphiqo swa marito. Ndlela leyi xiphiqo xa marito xi vumbiweke hayona, yi kumisisa hilaha swi olovaka kumbe swi tikaka hakona ku xi ololoxa. I swa nkoka ku tirhisa ririmi ro olova, leri nga erivaleni loko u ri karhi u andlala swiphiqo swa marito.

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:

Eka Ndzetelavutivi wa 6, hi langutile nkoka wa ku tirhisa ririmi ro olova, leri nga erivaleni na ku vutisa swivutiso leswi faneleke hi nkarhi wa migingiriko ya ku ololoxa swiphiqo swa marito. Hi tlhele hi vumba swiphiqo swa vutomi bya xiviri leswi nga eka mivangu leyi vadyondzi va nga kotaka ku tixakelanisa na yona. Eka Nghingiriko wa 9, mi ta kanela ku ololoxa swiphiqo hi vuenti swinene.

Nghingiriko wa 9

1. Languta swiphiqo swa marito leswi nga laha hansi.

♦ Xana xiphiqo xin'wana na xin'wana u nga xi ololoxa njhani?

♦ Xana u ehleketa leswaku vadyondzi va wena va le ka Giredi ya V va ta xi ololoxa njhani xiphiqo xin'wana na xin'wana?

♦ Hikwalahokayini swin'wana swa swiphiqo leswi swi tika swinene kutlula swin'wana?

♦ Tirhisa swihlayeri leswi nga etafuleni ra wena ku komba hilaha vadyondzi va nga ololoxaka swiphiqo leswi hakona.

Katsa	Hambanisa
Laylah u na 6 wa swiwitsi. Malusi u n'wi nyika 2 swin'wana. Xana Layalah u na swiwitsi swingani hinkwaswo ka swona?	Ku na 8 wa swiwitsi. Laylah u dya 3 wa swiwitsi. Xana i swingani swi nga sala swa Malusi?
Laylah u na 5 wa swiwitsi. Xana i swingani swo engetela a swi lavaka ku kota ku va na 8?	Laylah u na 8 wa swiwitsi. Malusi u dya swin'wana. Ku sala 4. Xana i swingani leswi Malusi a nga swi dya?
Laylah a ri na swiwitsi swin'wana. Malusi u n'wi nyika 2 swo engetela. Sweswi u na 8. Xana i swingani leswi Laylah a ri na swona ekusunguleni?	Laylah a ri na swiwitsi swin'wana. U nyikile Malusi 6 wa swiwitsi. U sale na 2 wa swiwitsi. Xana i swiwitsi swingani leswi a ri na swona ekusunguleni?

2. Tsala xiphiqo xa marito lexi u nga ta xi andlala eka vadyondzi va wena va le ka Giredi ya V xa xin'wana na xin'wana xa leswi landzelaka:

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.

Ku hlanganisa: 4 + 5 =

_____
_____
_____
_____

Ku susa: 7 – 3 =

_____
_____
_____
_____

Ku avela ku ri hava nsalo: 8 yi avelaniwa exikarhi ka 4 wa vadyondzi

_____
_____
_____
_____

Ku avela ku ri na nsalo: 5 yi avelaniwa exikarhi ka 2 wa vadyondzi

_____
_____
_____
_____

Tinotsi ta muhumelerisi
♦ PPT: Tafula ra 'katsa' na 'hambanisa'.
♦ Eka Giredi ya V, vadyondzi vanyingi va ta ololoxa swiphiqo hi ku tirhisa maqhinga kumbe tithekiniki: - ku hlayela hinkwaswo   - ku tirhisa swihlayeri kumbe tintiho ku endla vuyimeri bya mihlengelo leyi nga eku katsiweni kumbe eku hambanisiweni.   Vadyondzi vatsongo swinene va ta hlayela ku ya emahlweni kusuka eka nomboro leyikulukumba kutlula hinkwato hikuva levhele leyi ya vutivi bya nomboro bya ha hluvukisiwa.
♦ Kombela vatekaxiave ku avelana swikombiso swa vona na ntlawa lowukulu.

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.

<div>

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.

</div>

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.

_____
_____
_____
_____
_____
_____
_____
_____

Sexini ya 4: Nkunguhato wa ku dyondzisa

1½ ya tiawara

Ndzetelavutivi lowu wu lulamisela vatekaxiave eka ku tirhisa Mavhiki ya 7–10 ya Kotara ya 3. Hi nkarhi lowu wa lembe, mudyondzisi u ta va a lemukile ku hambana loku nga erivaleni exikarhi ka tilevhele ta vadyondzi ta ku ya emahlweni. Kotara ya 3 yi aka ehenhla ka vundzeni bya Kotara ya 1 na 2. Vadyondzi van'wana va ta va va lunghekerile leswi, loko van'wana va ta va va ha lava nseketelo na ku tiyisiwa swinene ku kota ku ya emahlweni. I swa nkoka ku kunguhata na ku lulamisela ku hambana loku eka vuswikoti bya mudyondzi ku tiyisisa leswaku vundzeni na swikili hinkwaswo swa Matematiki wa Giredi ya V swa angarheliwa, naswona vadyondzi va lulamele kahle Kotara ya 4.

Tinotsi ta muhumelerisi

Komba vhidiyo kutani mi kanela mitlhontlho na swivandlanene swa madyondziselo na madyondzelo lama hambanisiweke eka Giredi ya V. Loko vatekaxiave va nga vuli timhakakulu leti landzelaka, ti engeteli eka nkanelo.

♦ Vadyondzi hinkwavo va nga endla nghingiriko wo fana, kambe swivutiso swo olovanyana swi nga vutisiwa.

♦ Mudyondzisi a nga nyika ndzetelo wo tala eka vadyondzi vo nonokanyana/tsananyana na ku khutaza vadyondzi lava antsweke swinene ku kanela maehleketelelo ya vona.

♦ Vadyondzi va nga vekiwa hi mitlawa ya vuswikoti eka migingiriko yin'wana na mitlawa ya vuswikoti byo pfanganisiwa eka migingiriko yin'wana.

♦ Nxiyaxiyo na ku rhekodiwa ka nxiyaxiyo i swa nkoka. Swi olovisela mudyondzisi ku va na ntwisiso eka ku ya emahlweni ka mudyondzi un'wana na un'wana na ku tiva hilaha a nga pfunaka vadyondzi hakona.

Vhidiyo ya 2

Vhidiyo ya 1 yi hleriwile ku katsa mudyondzisi loyi a nga eku vulavuleni hi mayelana na hilaha a lawulaka hakona madyondziselo na madyondzelo lama hambanisiweke, na makambelelo eka tlilasini ya yena. Hlalelani vhidiyo ya mudyondzisi a ri karhi a kanela hilaha a tirhanaka hakona na vunavi bya vuswikoti bya vadyondzi etlilasini ya yena. Yingiselani leswi a swi vulaka hi mayelana na ku lawula ku hambana exikarhi ka tilevhele ta vuswikoti na hilaha a endlaka hakona hi mayelana na nkunguhato wa yena hi xikongomelo xa ku seketela swilaveko swa vadyondzi hi un'weun'we.

Tsala miehleketo ya wena hi mayelana na madyondziselo na madyondzelo lama hambanisiweke ekamareni ro dyondzela ra wena.

_____

_____

_____

_____

_____

_____

_____

_____

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?

Nghingiriko wa 10

1. Entlaweni wa n'wina, hetisani tithempuleti ta nkunguhato ta Mavhiki ya 7–10 ya Kotara ya 3 (Xiengetelwa xa A).

2. Ntlawa wa n'wina wu ta andlala nkatsakanyo wa nkanelo wa n'wina wa nkunguhato eka mitlawa leyin'wana. Tsalani timhakakulu ta nkanelo wa n'wina eka phepha ra chati yo pfula. Katsani tinhlamulo ta swivutiso leswi landzelaka:

   ♦ Xana i mitlhontlho yihi leyi mi yi langutelaka eka ku simeka Mavhiki ya 7–10?

   ♦ Xana u nga wu ololoxa njhani wun'wana na wun'wana wa mitlhontlho leyi hi xikongomelo xa ku fikelela masimekelo lama humelelaka?

   ♦ Xana nghingiriko lowu leteriwaka hi mudyondzisi wu nyika njhani swivandlanene swa mudyondzisi ku kambela na ku seketela vadyondzi?

   ♦ Xana migingiriko ya mitlawa leyitsongo leyi tshunxekeke ya pfumelela vutitoloveti byo enela bya vutivi byintshwa na swikili swintshwa?

Closing activities **30 minutes**

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.

Migingiriko yo pfala

Tinotsi ta muhumelerisi

♦ **Vuehleketisisi bya ndzetelavutivi**: Kombela vatekaxiave ku teka timinete tingaritingani ku ehleketisisa hi mayelana na siku leri na ku pfula *Buku ya Ntirho ya Vatekaxiave*. Va kombeli ku tsala swivutiso kumbe swibumabumelo swihi kumbe swihi ku avelana na ntlawa hinkwawo. Kombela vatekaxiave hi un'weun'we ku nyikela tinhlamulo kutani va ti tsala eka chati yo pfula.

♦ Khutaza vatekaxiave ku engetela swibumabumelo swihi kumbe swihi na mbiko wihi kumbe wihi lowu nga si avelaniwaka ebokisini ra poso.

♦ **Xintirhwana xo tlhelela na xona exikolweni:** Hlaya xintirhwana lexi. Vutisa loko ku ri na xihi kumbe xihi lexi xi nga riki erivaleni naswona xi lava ku hlamuseriwa hi vutalo swinene.

♦ **Nkambelo:** Phakela tikopi ta Fomo ya Nkambelo wa Ndzetelavutivi kutani u endla leswaku vatekaxiave va tatisa fomo leyi.

♦ **Ndzetelavutivi lowu landzelaka:** Nyika masiku ya ndzetelavutivi lowu landzelaka kutani u pfula ndzetelavutivi lowu.

Nghingiriko wa 11

Vuehleketisisi bya ndzetelavutivi: Teka timinete tingaritingani ku ehleketisisa hi mayelana na siku leri. Pfula *Buku ya Ntirho ya Vatekaxiave* ku titsundzuxa hi leswi swi angarheliweke. Tsala miehleketo ya wena.

_____
_____
_____
_____
_____

Avelanani vuehleketisisi bya n'wina na ntlawa lowukulu.

Xintirhwana xo tlhelela na xona exikolweni

1. Tirhisa *Xiletelo xa Migingiriko*: Kotara ya 3 ku kunguhata na ku tirhisa Mavhiki ya 7–10 ya Kotara ya 3 ya Nongonoko wa Matematiki.

2. Endla tinotsi ta leswi swi tirheke kahle swinene, leswi swi nga tirhangiki kahle swinene na hilaha u ololoxeke hakona mitlhontlho yihi kumbe yihi eka matirhiselo ya wena ya Mavhiki ya 7–10 ya Kotara ya 3.

3. Tsala swibumabumelo ebukwini leyi u yi tirhisaka ku landzelerisa ku ya emahlweni ka mudyondzi un'wana na un'wana (buku ya nxiyaxiyo wa vadyondzi). Tirhisa nxaxamelo wo xiyaxiya wa '**Kamba leswaku vadyondzi va kota ku**' (bokisi ra mahlo) hi nkarhi wa wun'wana na wun'wana wa migingiriko leyi leteriwaka hi mudyondzisi ku letela mixiyaxiyo na swibumabumelo swa wena.

4. Tana na buku ya wena ya nxiyaxiyo wa vadyondzi na tinotsi leti u ti endleke loko u ri karhi u ehleketisisa hi mayelana na madyondziselo ya siku rin'wana na rin'wana eka ndzetelavutivi lowu landzelaka.

5. Tana na kopi ya Kotara ya 3: Rhekodo ya Xikombiso ya Makambelelo lama Yaka Emahlweni (kusuka eka *Xiletelo xa Migingiriko: Kotara ya 3*) eka ndzetelavutivi lowu landzelaka.

Evaluation

Complete the Evaluation Form.

Nkambelo

Tatisa Fomo leya Nkambelo.

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		

XIENGETELWA XA A: THEMPULETI YA NKUNGUHATO WA VHIKI NA VHIKI WA KOTARA YA 3

Kotara ya 3: Kungu ra Migingiriko: Vhiki ra _____

XIYENGE XA VUNDZENI:		
NHLOKOMHAKA:		
TIVISA VUTIVI BYINTSHWA:		
TITOLOVETI:		
Migingiriko ya tlilasi hinkwayo	**Nghingiriko lowu leteriwaka hi mudyondzisi**	**Migingiriko ya le ka xitichi xo tirhela (migingiriko ya mitlawa leyitsongo leyi tshunxekeke)**
Siku ra 1		Nghingiriko wa 1
Siku ra 2		Nghingiriko wa 2
Siku ra 3		Nghingiriko wa 3
Siku ra 4		Nghingiriko wa 4
Siku ra 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: Kungu ra Migingiriko: Vhiki ra _____

XIYENGE XA VUNDZENI:
NHLOKOMHAKA:
TIVISA VUTIVI BYINTSHWA:
TITOLOVETI:

Migingiriko ya tlilasi hinkwayo	Nghingiriko lowu leteriwaka hi mudyondzisi	Migingiriko ya le ka xitichi xo tirhela (migingiriko ya mitlawa leyitsongo leyi tshunxekeke)	
Siku ra 1		Nghingiriko wa 1	
Siku ra 2		Nghingiriko wa 2	
Siku ra 3		Nghingiriko wa 3	
Siku ra 4		Nghingiriko wa 4	
Siku ra 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: Kungu ra Migingiriko: Vhiki ra ____

XIYENGE XA VUNDZENI:

NHLOKOMHAKA:

TIVISA VUTIVI BYINTSHWA:

TITOLOVETI:

Migingiriko ya tlilasi hinkwayo	Nghingiriko lowu leteriwaka hi mudyondzisi	Migingiriko ya le ka xitichi xo tirhela (migingiriko ya mitlawa leyitsongo leyi tshunxekeke)	
Siku ra 1		Nghingiriko wa 1	
Siku ra 2		Nghingiriko wa 2	
Siku ra 3		Nghingiriko wa 3	
Siku ra 4		Nghingiriko wa 4	
Siku ra 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: Kungu ra Migingiriko: Vhiki ra ____

XIYENGE XA VUNDZENI:			
NHLOKOMHAKA:			
TIVISA VUTIVI BYINTSHWA:			
TITOLOVETI:			
Migingiriko ya tlilasi hinkwayo		**Nghingiriko lowu leteriwaka hi mudyondzisi**	**Migingiriko ya le ka xitichi xo tirhela (migingiriko ya mitlawa leyitsongo leyi tshunxekeke)**
Siku ra 1			Nghingiriko wa 1
Siku ra 2			Nghingiriko wa 2
Siku ra 3			Nghingiriko wa 3
Siku ra 4			Nghingiriko wa 4
Siku ra 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?

_____
_____
_____
_____

Fomo ya Nkambelo ya Ndzetelavutivi wa 9

1. Xana ndzetelavutivi lowu wu fikelerile swilanguteriwa swa wena?

_____
_____
_____
_____

2. Xana u dyondzile yini eka ndzetelavutivi lowu wu ku pfuneke swinene?

_____
_____
_____
_____

3. Xana a ku ri na xilo xihi kumbe xihi lexi u nga xi tsakelangiki kumbe u veke na ku tikeriwa hi ku xi twisisa?

_____
_____
_____
_____

4. Xana u ta swi tirhisa njhani leswi u swi dyondzeke ekamareni ra wena ro dyondzela ra Giredi ya V?

_____
_____
_____
_____

5. Xana u na swiringanyeto swihi kumbe swihi swa ku antswisa miletelavutivi yo yisa emahlweni?

_____
_____
_____
_____