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Tshivenda/English

Mbekanyamushumo ya u Khwinifhadza Mbalo dza Gireidi ya T Grade R Mathematics Improvement Programme



Wekishopo ya 9 • Workshop 9
Nyendedzi ya Mutshimbidzi • Facilitator's Guide

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

The **Schools Development Unit (SDU)** at the **University of Cape Town (UCT)** is the mathematics technical partner to the Grade R Mathematics and Language Improvement Project. The SDU is a unit within UCT's School of Education that focuses on teachers' professional development in Mathematics, Science, Literacy/Language and Life Skills from Grade R to Grade 12. The SDU offers teacher qualifications and approved UCT short courses, school-based work, materials development and research to support teaching and learning in all South African contexts.

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Programme conceptualisation and management: Cally Kuhne and Tholisa Matheza

Translation and publishing project management: Arabella Koopman

Translation: Alugumi Rathumbu

Editing (Tshivenḁa): Ntshengedzeni Edward Mudau

Illustrations: Jiggs Snaddon-Wood

Mbalo dza Gireidi ya T na Thandela ya u Khwinisa Dzinyambo ndi vhurangeli ha **Gauteng Department of Education** na vhafarakani navho vha ndeme vha, **Gauteng Education Development Trust**.

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Mbekanyamushumo ya u sika muhumbulo na ndangulo: Vho Cally Kuhne na Vho Tholisa Matheza
U pindulela na ndangulo ya thandela ya nyanadadzo: Vho Arabella Koopman
Mukonanyi wa u pindulela (Tshivenḍa): Vho Ingrid Brink
U pindulela kha Tshivenḍa: Vho Alugumi Rathumbu
U dzudzanya na u vhalulula nga Tshivenḍa: Vho Ntshengedzeni Edward Mudau
Muoli: Vho Jiggs Snaddon-Wood

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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)

Manweledzo

Ndivho

Iyi ndi wekishopo ya vhuṭahe kha dza fumimbili dza Mbekanyamushumo ya u Khwinifhadza Mbalo dza Gireidi ya ṽ ine ya vhumba tshipiḁa tsha Muhasho wa Pfunzo wa Gauteng (GDE) Mbalo dza Gireidi ya ṽ na Thandela ya u Khwinisa Dzinyambo.

Ndivho ya wekishopo iyi ndi u thusa vhagudisi u thoma Mbekanyamushumo ya Mbalo ngomu kiḁasirumuni dzavho. Vhashelamulenzhe vha ḁo vha na tshikhala tsha u amba nga u thoma havho Mbekanyamushumo ya Mbalo na u haseledza u pulana havho, u funza na u linga. Vha ḁo dovha hafhu vha sedza mvelaphanḁa ya vhagudi, na ṭhoḁea dza u guda na mveledziso dza mugudi nga eṭhe. Vhashelamulenzhe vha ḁo amba nga maano a u linga u itela u ṅwala mvelaphanḁa ya vhagudi. Wekishopo i tandula magudiswa a Kotara ya 3 Vhege ya 7–10 na u thomiwa hadzo

U referentsiwa kha Sia ḁa Magudiswa ḁa Mbalo dza Gireidi ya ṽ zwo dzhiwa kha *Tshitatamennde tsha Pholisi tsha Kharikhulamu na u Linga (TSHIPHOKHALI): Mbalo dza Gireidi ya ṽ (Mvetamveto ya u Fhedzisela)*, 2011, Muhasho wa Pfunzo ya Mutheo, Afrika Tshipembe.

Mvelelo dza u guda

- ◆ U humbula nga u thomiwa ha Kotara ya 3 Vhege ya 4–6
- ◆ U tandula maano o ḁisendekaho kha u tamba u itela u tikedza u funza mbalo kha Gireidi ya ṽ
- ◆ U khwaṭhisedza kupfesesele kwa ḁivhaipfi ya nomboro kha Sia ḁa Magudiswa ḁa Nomboro, Tswayo na Vhushaka na u ṭumanya izwi na u thoma mbalo kiḁasini ya Gireidi ya ṽ
- ◆ U khwaṭhisedza kupfesesele kwa u linga ho teaho kha Gireidi ya ṽ
- ◆ U amba nga dzikhaedu na u wana thandululo dza u thoma Mbekanyamushumo ya Mbalo
- ◆ U pulana magudiswa a Mbekanyamushumo ya Mbalo ane a ḁo funzwa kha Kotara ya 3 Vhege ya 7–10

Magudiswa a wekishopo

- ◆ Mvulatswinga na mihumbulo (Awara 1)
 - ◆ Dzulo ḁa 1: Nomboro, Tswayo na Vhushaka (Awara 1)
- TIE
- ◆ Dzulo ḁa 2: Nomboro, Tswayo na Vhushaka (u bvela phanḁa) (Awara 1)
 - ◆ Dzulo ḁa 3: U rekanya kha Gireidi ya ṽ (Awara 1)
- TSHISWITṽULO
- ◆ Dzulo ḁa 4: U pulanela u funza (Awara 1½)
 - ◆ Nyito dza u vala (Minetse ya 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

Ndugiselo

- ◆ PPT u tangedza na mvelelo
- ◆ U divha dziPowerPoint na dzividiyo dzothe
- ◆ Kha vha vhale:
 - Nyendedzi ya Divhaipfi, masiatari a 138–161*
 - Nyendedzi ya Nyito: Kotara ya 3, masiatari a 120–185*
- ◆ Kha vha de na bogisi la poswo
- ◆ Kha vha humbudze vhashelamulenzhe u da na:
 - Nyendedzi ya Divhaipfi*
 - Nyendedzi ya Nyito: Kotara ya 2*
 - Nyendedzi ya Nyito: Kotara ya 3*
 - Bugu ya Dziphositara zwavho*
- ◆ Kha vha nwale mafhungo a tevhelaho kha zwiṭiripi zwihulwane zwa mabambiri zwiṇa:
 - Ndo guda ...
 - A tho ngo takalela ...
 - Zwino ndi a pfesesa ...
 - A thi athu vha khagala nga ...
- ◆ Kha vha gere zwiṭiripi zwa mabambiri a A4 u itela tshigwada tshiṇwe na tshiṇwe.

Matheriala

- ◆ Bammbiri la filipitshati, dzikhokhi
- ◆ Tshinambatedzi
- ◆ *Khithi ya Zwishumiswa* ya tshigwada tshiṇwe na tshiṇwe

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.

Mvulatswinga na mihumbulo

Awara 1

Mvulatswinga i katela u humbula na u amba nga tshenzhemo yavho na zwe vha guda. Kha vha sedze wekishopo dza Mbalo dze vha dzhenela vha fhedzise mafhungo ane mutshimbidzi a do țana.

Notsi dza mutshimbidzi

- ◆ PPT: Mvelelo dza u guda dza wekishopo.
- ◆ Kha vha vhee zwițiripi zwa mafhungo kha luvhondo:
 - Ndo guda ...
 - A tho ngo takalela ...
 - Ndo diphina ...
 - Zwino ndi a pfesesa ...
 - A thi athu vha khagala nga ...
- ◆ Kha vha vhee zwițiripi zwa mabambiri zwa A4 kha țafula inwe na inwe. Vhashelamulenzhe vha n̄wala phindulo dzavho dza mafhungo a zwițiripi kha zwițiripi zwa mabambiri a A4. Kha vha shumise Tshinambatedzi u țana zwițiripi zwavho fhasi ha mafhungo o teaho.
- ◆ Kha vha haseledze mahumbulwa na mbigela murahu zwa bogisini ła poswo u bva kha wekishopo dzo fhiraho. Kha vha humbudze vhashelamulenzhe u 'posa' mahumbulwa maswa mañwe na mañwe na mbigela murahu nga tshifhinga tsha wekishopo.

U amba nga u thoma

Notsi dza mutshimbidzi

- ◆ Kha vha humbudze vhashelamulenzhe nga *Mushumo wa u țuwa nawo tshikoloni* u bva mafheleloni a Wekishopo ya 8.
- ◆ Kha vha rumele vhashelamulenzhe kha **Nyito ya 1** na **2** vha vhale ndaela. Vhashelamulenzhe vha fhedzisa nyito zwigwadani zwavho. Zwigwada zwi kovhana mbuno dza ndeme na tshigwada tshihulwane.
- ◆ Nga murahu ha khaseledzo dza zwigwada zwițuku, kha vha dzhie mahumbulwa u bva tshigwadani tshiñwe na tshiñwe. Kha vha ite manweledzo a zwe zwa shuma zwavhuđi na dzikhaedu vha haseledze uri zwi kwama hani u thoma ngomu kiłasini.

Mushumo wa u țuwa nawo tshikoloni u bva kha Wekishopo ya 8, wo vha u tshi khou țođa vha tshi ita zwi tevhelaho:

- ◆ Kha vha shumise *Nyendedzi ya Nyito: Kotara ya 3* u pulana na u thoma Kotara ya 3 Vhege ya 4–6 dza Mbekanyamushumo ya Mbalo.
- ◆ Kha vha n̄wale mahumbulwa buguni ine vha i shumisa u itela u sedza mvelaphanđa ya mugudi muñwe na muñwe (bugu ya u lavhelesa vhagudi), vha shumise mutevhe wa u lavhelesa wa '**Kha vha țole uri vhagudi vha a kona u**' nga tshifhinga tsha nyito dzo rangwaho phanđa nga mugudisi dziñwe na dziñwe u itela u endedza u lavhelesa havho na mahumbulwa.
- ◆ Kha vha ite notsi dza zwe zwa shuma zwavhuđi, zwe zwa si shume zwavhuđi na uri vho tandulula hani dzikhaedu dziñwe na dziñwe nga tshifhinga tsha u thoma havho Kotara ya 3 Vhege ya 4–6.

Kha nyito dzi tevhelaho kha vha shumise bugu ya u lavhelesa vhagudi na notsi dze vha ita musi vha tshi amba nga đuvha liñwe na liñwe ła u funza.



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.



Nyito ya 1

1. Tshigwadani tshavho, kha vha kovhane zwe zwa shuma zwavhuḁi na dzikhaedu musi vha tshi khou thoma Mbekanyamushumo ya Mballo kha Kotara ya 3 Vhege ya 4–6. Kha vha kovhane maano a u khwinisa u funza na u guda a dzikhaedu dze vha topola.

2. Kha vha haseledze tshumiso yavho ya mutevhe wa u lavhelesa wa **'Kha vha ṭole uri vhagudi vha a kona u'** (kha iṭo tshibogisini) nga tshifhinga tsha nyito dzo rangwaho phanḁa nga mugudisi dziṅwe na dziṅwe.

Kha vha sumbedze miraḁo ya tshigwada tshavho bugu yavho ya u lavhelesa vhagudi. Kha vha nange mugudi muthihi vha haseledze zwe vha lavhelesa nga mvelaphanḁa ya uyu mugudi.

3. Kha vha ṅwale mbuno khulwane dza khaseledzo yavho kha bammbiri ḁa filipitshati. Kha vha vhigele murahu khaseledzo yavho kha tshigwada tshihulwane.



Vidiyo ya 1

Nyendedzi ya Nyito: Kotara ya 3, Vhege ya 6, Nyito yo rangwaho phanḁa nga mugudisi (masiaṭari a 114–117)

Kha vha ṭalele vidiyo ya mugudisi a tshi khou shuma na tshigwada tshiṭuku tsha vhagudi nga tshifhinga tsha nyito yo rangwaho phanḁa nga mugudisi kha Kotara ya 3 Vhege ya 6. Zwo sedzeswaho nga u lavhelesa havho kha wekishopo iyi ndi uri mugudisi u lamukanya hani nyito dza nomboro.

Kha vha lavhelese uri mugudisi u shuma hani nga nyito dza rathi. Vha dzhieleshe:

- ◆ uri u ḁivhadza hani thaidzo
- ◆ luambo lune a lu shumisa musi a tshi vhudzisa mbudziso
- ◆ uri u dzudzanya hani nyito
- ◆ mbudziso dzine a vhudzisa u endedza vhagudi.



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.



Nyito ya 2

Kha vha sedze nyito ya rangwaho phanda nga mugudisi (masiatari a 114–117) kha Vhege ya 6 ya *Nyendedzi ya Nyito: Kotara ya 3*.

1. Kha vha haseledze uri vho langisa hani nyito iyi yo rangwaho phanda nga mugudisi na kilasi yavho.

2. Vho vhuya vha tangana na dzikhaedu? Arali zwo ralo, vho dzi tandululisa hani?

Notsi dza mutshimbidzi

Kha vha sumbedze vidiyo vha range phanda khaseledzo yo disendekaho nga nyito dza mbalo na mbudziso. Arali vhashelamulenzhe vha sa bule mbuno dzi tevhelaho, kha vha dzi engedze kha khaseledzo.

- ◆ Nyito ndi pfufhi. Mugudisi ha sokou monamona zwi songo tea musi a tshi phakhela zwishumiswa kana u amba na mugudi muthihi tshifhinga tshilapfu. Miratho i a tavhanya nahone mugudisi u langula nyito dza rathi fhasi ha tshifhinga tsho avhelwaho.
- ◆ Mbudziso dzothe dzo vhudziswa na luambo lwo shumiswa zwi khagala na u sa lapfa.
- ◆ Nyito dzi fhaṭa kha ndivho ya murahu na u tandavhudza mihumbulo miswa.
- ◆ U thetshesha kha na u lavhelesa mugudi **muṅwe na muṅwe** zwi netshedza ndivho nga mvelaphanda yavho. Zwi thusa vhone u topola vhukoni ha vhagudi na magake kha zwikili zwavho na/kana kupfesesele.

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.

Dzulo la 1: Nomboro, Tswayo na Vhushaka Awara 1

Kha wekishopo dzo fhiraho ro haseledza nga Sia la Magudiswa la Nomboro, Tswayo na Vhushaka. Kha dzulo ili ri do dalela hafhu thero dza nomboro dzo fhambanaho nahone ri do tshandavhudza khaseledzo yashu u itela u pfesesa u ya phanda na divhaipfi ya nomboro. Ri do tandula masia a tevhelaho a nomboro na u a tumanya na ndowelo ya kilasini:

- ◆ u vhalela ha mutevhetsindo
- ◆ u anganyela
- ◆ u imela nomboro
- ◆ u vhalela zwithu
- ◆ nomboro thevhekano
- ◆ u rekanya.

U vhalela ha mutevhetsindo

Notsi dza mutshimbidzi

- ◆ U vhalela ha mutevhetsindo zwi katela u bula maipfinomboro nga u tevhekana. Vhagudi vha tevhekanya nomboro nga tshifhinga tsha ndowelo ya nyito dza u vhalela ha mutevhetsindo na nga tshifhinga tsha miratho. Nyimbo, zwidade na nyito zwi ita uri u vhalela ha mutevhetsindo hu difhe ngeno vha tshi khou guda mutevhe wa nomboro. Musi vhagudi vha tshi vho kona u dovhola u tevhekana ha nomboro nga mutevhe wo teaho wa u vhalela, vha thoma u amba nga vhushaka vhukati ha nomboro, sa tsumbo, ndi nomboro ifhio i re phanda ha, vhukati ha kana i re murahu ha inwe nomboro.
- ◆ Kha vha nange tshigwada tshithihi u kumedza khaseledzo yatsho ya **Nyito ya 3**.

Vhana vha guda mutevhe wo teaho wa maipfinomboro zwenezwi vha tshi khou tamba, u imba, na u dovhola zwidade.

Vhunga ri tshi zwi divha, u vhalela ha mutevhetsindo zwi katela u bula maipfinomboro nga u tevhekana. Vhagudi vha tevhekanya nomboro nga tshifhinga tsha ndowelo ya nyito dza u vhalela ha mutevhetsindo na nga tshifhinga tsha miratho. Nyimbo, zwidade na nyito zwi ita uri u vhalela ha mutevhetsindo hu difhe, fhedzi ho sedzeswa kha mutevhe wa nomboro. Musi vhagudi vha tshi vho kona u dovhola u tevhekana ha nomboro nga mutevhe wo teaho wa u vhalela, vha thoma u amba nga vhushaka vhukati ha nomboro, sa tsumbo, ndi nomboro ifhio i re phanda ha, vhukati ha kana i re murahu ha inwe nomboro.



Nyito ya 3

Tshigwadani tshavho, kha vha haseledze uri nyito dzi tevhelaho dzo tshuwedza hani u guda u tevhekana ha u vhalela maipfi kilasini yavho:

- ◆ nyimbo na zwidade
- ◆ muthambi wa u anea nomboro
- ◆ leri dza u fhufha.

Notsi dza mutshimbidzi

- ◆ PPT: 'Ṱhalutshedzo' dzo fhambanaho dza nomboro na tshakha dzo fhambanaho dza nomboro.
- ◆ Kha vha haseledze 'Ṱhalutshedzo' dzo fhambanaho dza nomboro na tshakha dzo fhambanaho dza nomboro, na zwe nomboro dza sedzesa khazwo kha Gireidi ya Ṱ.



Nyito ya 4

Kha vha vhale mafhungo a re kha masiatari a 138–143 vha lavhelese nyolo i re nṰha ha masiatari a 144–145 a *Nyendedzi ya Divhaipfi*.

Tshigwadani tshavho, kha vha haseledze masia a tevhelaho a nomboro:

- ◆ 'Ṱhalutshedzo' dzo fhambanaho dza nomboro

- ◆ tshakha dzo fhambanaho dza nomboro

Vhagudi vha re kha Gireidi ya Ṱ vha anzela u shuma nga mbalosa 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 na 10. (Kha Gireidi ya 1 izwi zwi engedzwa u ya kha 20 na u fhira.) Ri sedzesa kha u vhalela na u imela nomboro nga nṰila dzo fhambanaho na u Ṱetshedza vhagudi zwikhala zwa u shuma na nomboro kha nyimele dzo fhambanaho.

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?

U anganyela

Notsi dza mutshimbidzi

- ◆ Kha vha shumise magaraṭa a tshithoma u bva kha *Khithi ya Zwishumiswa*.
- ◆ Kha vha humbele vhashelamulenzhe uri vha vha vhudze uri 'ndi zwingana' zwine vha khou vhona zwenezwi vha tshi khou sumbedza garaṭa ḽa tshithoma ḽiṅwe na ḽiṅwe nga u ṭavhanya:
 - Kha vha sumbedze garaṭa ḽa zwithoma 3.
 - Kha vha sumbedze garaṭa ḽa zwithoma 2.
 - Kha vha imisele nṯha magaraṭa ayo o vhambelana.
- ◆ Kha vha ṭalutshedze uri u anganyela ndi mini (*Nyendedzi ya Divhaipfi* masiaṭari a 144–147) vha haseledze uri tshikili itshi tshi vhuedza hani vhana zwenezwi vha tshi khou guda nga nomboro:
 - Vhagudi vha anḽanya madzina a nomboro na khuvhanganyo ṭhukhu.
 - Vhagudi vha topola ṭhanganyelo kha khuvhanganyo (u swika kha ṭhanu) vha songo vhalela.
 - Vhagudi vha thoma u ḽivha uri, sa tsumbo, 'ṭhanu na nthihi ndi rathi'.
 - Zwi fhaṭa nḽivho ya nomboro.
 - Vhagudi vha pfelesa uri nomboro i nga kwashiwa na u fhaṭiwa. (Phaṭhekhanyo idzi dza nomboro dzi vha mutheo wa phaṭhekhanyo.)
 - Zwi fhaṭa u guda nga mbilu na u elelwa ha mutheo ha mbuno dza nomboro.
- ◆ Kha vha haseledze nyito dza kiḽasini dzine dza khwaṭhisedza u anganyela. Izwi zwi katela:
 - nyito dza garaṭa ḽa tshithoma
 - vhulungu ha u vhalela
 - mitambo ya daisi
 - domino
 - nyito dza u dzinginya na u kwasha.



Nyito ya 5

Kha vha lavhelese mutshimbidzi. Tshifhinga tshoṭhe a tshi sumbedza garaṭa, kha vha ambe nga u ṭavhanya nga hune vha nga kona uri vha khou vhona zwithoma 'zwingana'.

1. Vho vhalela tshithoma tshiṅwe na tshiṅwe nga tshithihitshithihi? Ndi ngani zwi songo ralo?

2. Vha humbula uri mbuelo ya u khwaṭhisedza tshikili tsha u anganyela ndi ifhio?

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. Ndi nyito dzifhio dzine dza khwaṭhisedza vhukoni ha u anganyela dze vha dzi shumisa kha madzulo a mbalo a Kotara ya 1 na 2 dzavho?

Kha vha sedze masiaṭari a 144–147 a *Nyendedzi ya Ḑivhaipfi*.

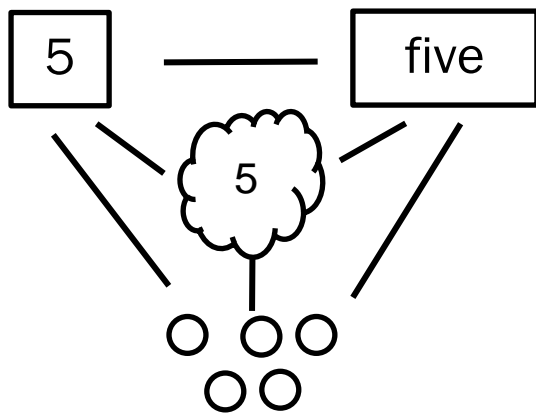
U imela nomboro

Notsi dza mutshimbidzi

- ◆ PPT: Tshifanyiso tsha nyolo i re kha iyi khethekanyo ine ya sumbedza vhuṭumani vhukati ha nomboro na u imelwa hayo ho fhambanaho.
- ◆ Kha vha ṭalutshedze ḑivhaipfi ya nomboro sa zwo dodombedzwaho afho fhasi.
- ◆ Kha vha ṭalutshedze uri vhagudi vha fanela u pfesesa tshipiḑa tshiṅwe na tshiṅwe u itela u ita vhuṭumani vhukati hazwo.
 1. '5' i re vhukati ha nyolo ndi nomboro 5, na uri izwi ndi muhumbulo khumbulelwa.
 2. Vhagudi vha fanela u kona u imela ḑivhaipfi ya 5 sa khuvhanganyo, vha tshi shumisa zwithu zwi fareaho, u fana na zwithu zwa u vhalela ngazwo, u itela u imela nomboro 5.
 3. Vhagudi vha fanela u guda uri '5' i nga ṅwalwa sa tshiga na uri tshiga 5 tshi imela hafhu khuvhanganyo (ya zwithu zwa u vhalela ngazwo).
 4. Vhagudi vha fanela u guda uri ipfinomboro 'ṭhanu' ḑi nga ṅwalwa u itela u imela tshiga na khuvhanganyo.
 5. Tsha u fhedzisela, vhagudi vha fanela u ita vhuṭumani vhukati ha u imela ho fhambanaho uhu ha ṭhanu u itela uri vha pfesese tshoṭhe ḑivhaipfi.

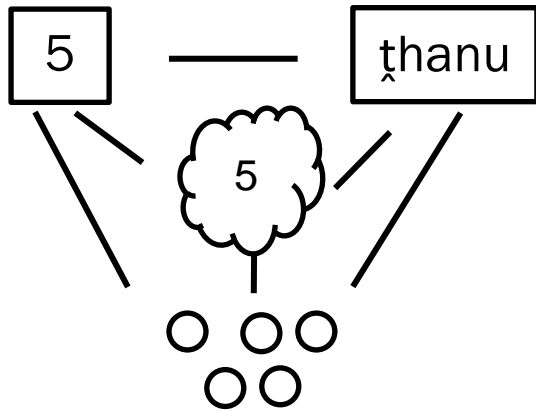
Nomboro ndi ḑivhaipfi khumbulelwa. Ndi muhumbulo une wa vha hone ṭhohoni yavho. A ri koni u vhona nomboro, zwenezwo ri fanela u wana ṅḑila dzo fhambanaho dza u imela (u sumbedza) nomboro ine ha khou ambiwa ngayo. Vhagudi vha fanela u ita vhuṭumani vhukati ha muhumbulo wa nomboro, sa tsumbo, 5, na u imelwa hayo ho fhambanaho, u fana na khuvhanganyo ya zwithu, tshiga, ipfi. Vha fanela hafhu u pfesesa uri arali ra ri, 'ndi mangana' maḑegere, u vhanda zwanda, nnḑu, maḑuvha a mabebo, ngauralongauralo, ṭhanu tshifhinga tshoṭhe i amba tshivhalo tshi fanaho tsha zwithu izwi.

Vhagudi vha fanela u rwela ngomani 'uri zwithu ndi zwingana' kana u vhalela khuvhanganyo i sa fareiho na i fareaho ya nomboro. U fhirisela ḑivhaipfi iyi kha vhagudi, vhagudisi vha fanela u ḑivhadza muhumbulo vha tshi shumisa zwithu zwi fareaho, sa tsumbo, zwithu zwa u vhalela ngazwo. U thusa vhagudi uri vha pfesesa ḑivhaipfi ya nomboro, vha fanela u zwi limuwa uri nomboro dzi nga imelwa nga ṅḑila dzo fhambanaho. Vhagudi vha fanela hafhu u ita vhuṭumani vhukati ha u imela nomboro ho fhambanaho, sa tsumbo, tshithu, tshifanyiso, tshiga na ipfi.



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.



Notsi dza mutshimbidzi

- ◆ Kha vha haseledze nga uri muhumbulo wa u imela hunzhi u n̄etsshedza hani ndeme ya ngona ya u d̄ivhadza nomboro nga tshiṭori kha Mbekanyamushumo ya Mbalo.
- ◆ Kha vha humbudze vhashelamulenzhe nga n̄ḍowelo yo shumiswaho u funza nombro iñwe na iñwe:
 - Tshati ya luvhondoni ya mbalo na tshiṭori: kha vha fhaṭe n̄ḍu nga u sumbedza tshi/zwifanyiso, nomboro ya n̄ḍu, bele ya/dza muṅangoni na ipfinomboro.
 - U fanyisa zwithu, zwiga zwa nomboro, maipfinomboro na magaraṭa a tshithoma.

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	

Dzulo la 2: Nomboro, Tswayo na Vhushaka (u bvela phanda)

Awara 1

U vhalela zwithu

Notsi dza mutshimbidzi

- ◆ Kha vha tendele minetse ya 40 u itela khethekanyo iyi ya Dzulo la 2.
- ◆ PPT: Kha vha nweledze milayo ya u vhalela (*Nyendedzi ya Divhaipfi* siaṭari la 148–149). Kha vha i kumedze nga muthihimuthihi. Milayo iyi ya u vhalela ndi mutheo wa u guda u vhalela. Musi vhagudi vha tshi vho kona u shumisa milayo iyi, ri nga ri vha a kona u vhalela. Kha vha bwisele khagala uri vhagudi vha fanela u kona u sumbedza milayo ya u vhalela yoṭhe miṭanu phanda ha musiri tshi nga ri vha a kona u vhalela.
- ◆ Kha vha humbele vhashelamulenzhe u shumisa zwishumiswa zwi re nṭha ha ṭafula u sumbedza u pfesesa havho milayo ya u vhalela nga muthihimuthihi.
- ◆ U pfumbisa, kha vha sumbedze mulayo muṅwe na muṅwe kha tshigwada tshihulwane.
- ◆ Kha vha haseledze nyito dza kīlasini dza ḍuvha liṅwe na liṅwe dzine dza khwaṭhisedza u vhalela zwithu he vhashelamulenzhe vha ita kha Kotara ya 1 na 2.
- ◆ Kha vha vhale bogisi la 'Ndowedzo' li re kha siaṭari la 151 la *Nyendedzi ya Divhaipfi* u itela u ṭalutshedza uri vhagudi vha bvela phanda hani zwenezwi vha tshi khou guda u vhalela na u ṭanganya zwigwada zwa zwithu.

U vhalela uri '**ndi zwingana**', vhagudi vha fanela u limuwa uri tshithu tshiṅwe na tshiṅwe tshi re kha tshigwada tshi na dzina la nomboro na uri vha vhalela tshithu tshiṅwe na tshiṅwe luthihi fhedzi.

Hu na milayo miṭanu ya u vhalela ine ya ṭalusa maitete a u guda u vhalela. Musi vhagudi vho no pfesesa na u kona u shumisa milayo iyi ya u vhalela yoṭhe miṭanu, ri a kona u amba uri vha a kona u vhalela.



Nyito ya 6

Kha vha vhale mafhungo a re kha masiaṭari a 148–151 a *Nyendedzi ya Divhaipfi*.

1. Kha vha shumise zwishumiswa zwo newaho u sumbedza milayo iyi sa zwe ya ṭalutshedziswa zwone ngomu ha *Nyendedzi ya Divhaipfi*.
2. Kha vha haseledze mulayo muṅwe na muṅwe tshigwadani tshavho vha ite notsi dzavho kha thebuḽu i re afho fhasi u itela u ṭalutshedza kupfesesele kwavho kwa mulayo muṅwe na muṅwe.

Mulayo wa u livhanyisa tshithu nga tshithu	
Mulayo wa u vhalela na vhunzhi	

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.

Mulayo wa nomboro ya u vhalelwa lwa u fhedza	
Mulayo wa u vhalela khuvhanganyo i fareaho na i sa farei	
Mulayo wa u sa vha na ndeme ya u tevhekana	

Nomboro thevhekano

Ro haseledza tshakha dza nomboro dzine dza ri vhudza uri 'ndi zwingana'. Idzi dzi vhidzwa **nomboro dza u vhalelwa lwa u fhedza**.

Hu dovha hafhu ha vha na nomboro dzine dza sumbedza vhuimo ha tshithu kana muñwe muthu kha tselano kana mutevhe. Idzi dzi vhidzwa **nomboro thevhekano**.

Notsi dza mutshimbidzi

- ◆ Kha vha tendele minetse ya 20 u itela khethekanyo iyi ya Dzulo la 2.
- ◆ Vhashelamulenzhe vha nanga zwithu zwa u vhalela ngazwo zwa phukha zwa rathi u bva kha *Khithi ya Zwishumiswa* vha zwi dzudzanya nga muduba, zwo sedza mondeni.
- ◆ Kha vha vhudzise mbudziso idzi:
 - Ndi phukha ifhio i re mathomoni?
 - Ndi phukha ifhio i re ya vhuvhili?
 - Khuhu yo vhewa ngafhi?
 - Ndi phukha ifhio i tevhelaho?
 - Ndi muvhala ufhio wa phukha ya vhuraru?

Vha dzhieze nzhele: Vhashelamulenzhe vha do vha na nzudzanyo dzo fhambanaho dza phukha, zwenezwo kha vha vha tendele u nea phindulo u ya nga mutevhe wa phukha kha nzudzanyo dzavho.
- ◆ Kha vha humbele vhashelamulenzhe u rembulusa phukha u itela uri dzi sedze kha tshau la.
- ◆ Kha vha dovholele mbudziso dzi re afho ntha.
- ◆ Kha vha haseledze uri nomboro thevhekano dzi itwa ndowendowe hani nga tshifhinga tsha ndowelo na nyito zwa duvha linwe na linwe, sa tsumbo, musi vha tshi khou dubekanya kana musi vha tshi khou ita mbambe dza nnda.
- ◆ Kha vha sedze muthambi wa u anea nomboro. Kha vha vhudzise uri ndi nomboro ifhio ya *u thoma*, ya *vhuvhili*, *tsini na*, *phanza ha*.



Nyito ya 7

Kha vha dzudzanye zwithu zwa u vhalela ngazwo zwa phukha zwi re kha tafula u ya nga ndaela dza mutshimbidzi. Kha vha fhindule mbudziso dzawe nga vhuimo ha zwithu zwa u vhalela ngazwo zwa phukha.

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.

Notsi dza mutshimbidzi

- ◆ Kha vha haseledze murekanyo u re kha Gireidi ya T nga u ita manweledzo a mafhungo a re afho fhasi.
- ◆ **Nyito ya 8:** Kha vha nee tshigwada tshiṭuku tshiṅwe na tshiṅwe tshishumiswa tshi sa fani na tsha tshiṅwe:
 - zwithu zwa u vhalela ngazwo
 - vhulungu ha u vhalela
 - magaraṭa a tshithoma
 - zwibuloko zwa Yunifikisi.Vha dzhiele nzhele: Vha ḑo vha na tshigwada tshi fhiraho tshithihi tshi re na zwishumiswa zwa lushaka lu fanaho.
- ◆ Nga murahu ha musu tshigwada tshiṅwe na tshiṅwe tsho no sumbedza, kha vha haseledze ndila dzo fhambanaho dzine vhagudi vha wana ngadzo phaṭhekhanyo nga u fhaṭa na u kwasha nomboro.
- ◆ Kha vha bule uri u pfesesa nomboro khulwane kha 5 zwo ḑisendeka kha ḑivhaipfi ya nomboro dzo gudwaho dza nomboro 5 na ṭhukhu. Kha vha ambe uri Kotara ya 1 na 2 dzo ṅetshedza hani tshenzhemo ya u guda nga nomboro 1-5. Izwi zwi vhumba mutheo wa u pfesesa nomboro khulwane kha 5.

Vhagudi vha fanela u pfesesa ndeme ya nomboro na vhushaka vhukati hadzo vha sa athu shuma mbalo u fana na u ṭanganya na u ṭusa. Vha fanela u ḑivha, sa tsumbo, 'ndi nngana' tharu dzi re hone; 3 i ḑa phanḑa ha 4, nga murahu ha 2 na vhukati ha 2 na 4; na uri 3 i i fhira 2 nga nthihi na u vha ṭhukhu kha 4 nga nthihi.

U shuma nga mutambo wa zwithu zwa u vhalela ngazwo, vhulungu ha u vhalela, magaraṭa a tshithoma, na u dzinginya na u kwasha zwi ṅetshedza vhagudi zwikhala zwa u pfesesa uri nomboro dzi nga fhaṭiwa kana dza kwashiwa. Nga ndila iyi, nga zwiṭuku vha thoma u ḑivha uri nomboro dzo itwa nga phaṭhekhanyo nnzhi dzo fhambanaho dza dziṅwe nomboro. Sa tsumbo, nomboro 5 i nga vhumbwa nga:

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

Kha Gireidi ya T, vhagudi vha tandula ndila dzo fhambanaho dza u fhaṭa na u kwasha nomboro, na u ṭanganya na u ṭusa vha tshi shumisa zwithu zwa u vhalela ngazwo.



Nyito ya 8

Kha vha vhale mafhungo a re kha masiaṭari a 154-156 a *Nyendedzi ya ḑivhaipfi*.

Kha vha humbule nga uri vho shumisa hani matheriala o ṅetshedzwaho kha Mbekanyamushumo ya Mbalo u thusa vhagudi u pfesesa kushumele kwa nomboro (murekanyo) na vhushaka. Kha vha shumise matheriala u sumbedza izwi.

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. Vhagudi vha tandula hani ðivhaipfi ya nomboro kha Mbekanyamushumo ya Mbalo vha tshi shumisa matheriala o ñetshedzwaho?
2. Ndi mbudziso dzifhio dzine vha nga vhudzisa dzine dza ðo endedza u guda havho? (Kha vha sedze siaṭari 1a 157 1a Nyendedzi ya *Ðivhaipfi* u itela tsumbo dza mbudziso.)

Kha vha ðilugisele u kumedza khaseledzo yavho kha tshigwada tshihulwane.

Thaidzo dza ipfi

Notsi dza mutshimbidi

- ◆ Nga u pfufhifhadza kha vha ambe nga thaidzo dza ipfi na mbudziso zwo haseledzwaho kha Wekishopo ya 6. Kha vha ṭalutshedze uri musi ri tshi amba nga thaidzo dza ipfi, a ri khou amba nga mbudziso dza phindulo dzo ṭandavhuwaho. Thaidzo dza ipfi kana 'tshiṭori tsha mbalo' ndi nyimele dzine dza ṭoḡa uri vhagudi vha Gireidi ya Ṭ vha shumise maano a u ṭanganya, u ṭusa, u kovha na u vhea nga zwigwada.
- ◆ Nga zwigwada, vhashelamulenzhe vha tandulula thaidzo dza ipfi dzi re kha **Nyito ya 9**.
- ◆ U itela thaidzo ya ipfi inwe na inwe, kha vha haseledze phindulo dzavho dza mbudziso.
- ◆ Kha vha humbudze vhashelamulenzhe uri luambo lwo shumiswaho lu fanela u leluwa nahone lu vhe khagala. Nḡaḡo na u konḡa hune vhagudi vha ṭangana naho musi vha tshi tandulula thaidzo dza ipfi zwi anzela u vhangwa nga mbumbo ya luambo lwo shumiswaho u ṭahisa thaidzo, u fhira u shaea ha kupfesesele kwa mbalo.

Vhagudi vha Gireidi ya Ṭ vha fanela u tandulula thaidzo dza ipfi nga u tou amba hu tshi katelwa u ṭanganya, u ṭusa, na u kovha u eḡana na u vhea nga zwigwada. Vha fanela hafhu u ṭalutshedza kuhumbulele kwavho na nḡila dza u tandulula thaidzo dzo fhambanaho.

Kha vha ñee vhagudi tshifhinga tshinzhi tsha u humbula nahone vha vha tendele u shumisa zwithu zwa vhukuma (sa tsumbo, zwithu zwa u vhalela ngazwo, minwe, vhulungu ha u vhalela) u tandulula thaidzo na u ṭola phindulo dzavho.

Musi vha tshi kumedza thaidzo ya ipfi kha vhagudi, ndi zwa ndeme u vha ṭuṭuwedza u:

- ◆ wana maano a u tandulula thaidzo
- ◆ ṭalutshedza uri vho tandululisa hani thaidzo
- ◆ bula uri ndi ngani vha tshi humbula uri phindulo yavho ndi yone.

Nyimele dzo ḡowealeho dza u ṭanganya na u ṭusa dzi nga kumedzwa sa thaidzo dza ipfi. Nḡila ye thaidzo ya ipfi ya vhumbiwa ngayo, i ta uri zwi nga konḡa kana u leluwa hani u tandulula. Ndi zwa ndeme u shumisa luambo lu pfalaho, lwo leluwaho musi vha tshi kumedza thaidzo dza ipfi.

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:

Kha Wekishopo ya 6 ro lavhelesa kha ndeme ya u shumisa luambo lu sa konḁi, lu re khagala na u vhudzisa mbudziso dzo teaho nga tshifhinga tsha nyito dza u tandulula thaidzo. Ro dovha ra dizaina thaidzo dza vhukuma kha nyimele dzine vhagudi vha nga dzi ḁivha. Kha Nyito ya 9, vha ḁo haseledza u tandulula thaidzo nga vhuḁalo.



Nyito ya 9

1. Kha vha lavhelese thaidzo dza ipfi dzi re afho fhasi.
 - ◆ Vha ḁo tandululisa hani thaidzo inwe na inwe?
 - ◆ Vha humbula uri vhagudi vhavho vha Gireidi ya T vha ḁo tandululisa hani thaidzo inwe na inwe?
 - ◆ Ndi ngani dziinwe dza thaidzo idzi dzi tshi konḁa u fhira dziinwe?
 - ◆ Kha vha shumise zwithu zwa u vhalela ngazwo zwi re kha ḁafula yavho u sumbedza uri vhagudi vha ḁo tandululisa hani thaidzo.

U ḁanganyisa	U fhambanyisa
Laylah u na maḁegere a 6. Malusi a mu ḁea maḁwe 2. Lylah u na maḁegere mangana o fhelela oḁhe?	Hu na maḁegere a 8. Laylah a ḁa maḁegere 3. Ho sala maḁegere mangana a Malusi?
Laylah u na maḁegere 5. U ḁoḁa maḁwe mangana uri a vhe na a 8?	Laylah u na maḁegere a 8. Malusi a ḁa maḁwe. Ho sala 4. Malusi o ḁa maḁegere mangana?
Laylah o vha e na maḁegere. Malusi a mu ḁea maḁwe 2. Zwino u na a 8. Laylah o vhe e na maḁegere mangana mathomoni?	Laylah o vha e na maḁegere. O ḁea Malusi maḁegere a 6. O sala na maḁegere 2. O vha e na maḁegere mangana mathomoni?

2. Kha vha ḁwale thaidzo ya ipfi ine vha nga kumedza kha vhagudi vhavho vha Gireidi ya T kha tshinwe na tshinwe tsha zwi tevhelaho:

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.

U țanganya: $4 + 5 =$

U țusa: $7 - 3 =$

U kovha hu si na tshițahe: 8 yo kovhiwa vhukati ha vhagudi 4

U kovha ha vha na tshițahe: 5 yo kovhiwa vhukati ha vhagudi 2

Notsi dza mutshimbidzi

- ◆ PPT: Țafula ya 'u țanganya' na 'u fhambanyisa'.
- ◆ Kha Gireidi ya Ț, vhunzhi ha vhagudi vha Țo tandulula thaidzo vha tshi shumisa maano kana thekiniki izwi:
 - u vhalela zwoțhe
 - u shumisa zwithu zwa u vhalela ngazwo kana minwe u imela khuvhanganyo dzi no khou țanganywa kana u fhambanywa.Vhagudi vha si gathi vha Țo vhalela u ya phanȚa u bva kha nomboro khulwane ngauri țevele iyi ya nȚivho ya nomboro i kha Ți bveledzwa.
- ◆ Kha vha humbele vhashelamulenzhe u kovhana tsumbo dzavho na tshigwada tshihulwane.

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.

Dzulo la 4: U pulanela u funza

Awara 1½

Dzulo ili la wekishopo li lugisela vhashelamulenzhe u thoma Kotara ya 3 Vhege ya 7–10. Nga tshifhinga tshino tsha n'waha, mugudisi u do vha o no limuwa phambano vhukati ha levele dza mvelaphanda dza vhagudi. Kotara ya 3 i fhaṭa kha magudiswa a Kotara ya 1 na 2. Vhanwe vhagudi vha do vha vho no lugela izwi, ngeno vhanwe vha tshi do toda thikhedzo na u pfumbiswa hunzhi u itela mvelaphanda. Ndi zwa ndeme u pulana na u lugisela phambano iyi kha vhukoni ha vhagudi u itela uri magudiswa na zwikili zwothe zwa Gireidi ya T zwo kwamiwa, nahone vhagudi vho lugiselwa zwavhuḁi Kotara ya 4.

Notsi dza mutshimbidzi

Kha vha sumbedze vidiyo vha haseledze khaedu na zwikhala zwa u funza na u guda ho fhambanaho kha Gireidi ya T. Arali vhashelamulenzhe vha sa bule mbuno dzi tevhelaho, kha vha dzi engedze kha khaseledzo.

- ◆ Vhagudi vhothe vha nga ita nyito i fanaho, fhedzi hu nga vhudziswa mbudzi dza sa konḁi.
- ◆ Mugudisi a nga netshedza nyendedzi n'zhi kha vhagudi vha ongolowaho na u tuṭuwedza vhagudi vha konaho u haseledza kuhumbulele kwavho.
- ◆ Vhagudi vha nga vheva nga zwigwada zwa vhukoni u itela nyito dziṅwe na nga zwigwada zwa vhukoni ho fhambanaho u itela nyito dziṅwe.
- ◆ U lavhelesa na u rekhoda u lavhelesa ndi zwa ndeme. Zwi thusa mugudisi u vha na nḁivho nga mvelaphanda ya mugudi muṅwe na muṅwe na u ḁivha uri a nga thusa hani vhagudi.



Vidiyo ya 2

Vidiyo ya 1 yo dzudzanywa u itela u katela mugudisi a tshi khou amba nga uri u langa hani u funza na u guda ho fhambanaho, na u langa ngomu kilaṣini yawe.

Kha vha talele vidiyo ya mugudisi a tshi talutshedza uri u shuma hani na vhukoni ho fhambanaho ha vhagudi ngomu kilaṣini yawe. Kha vha thetshesele zwine a khou amba nga u pulana na u langa phambano i re vhukati ha levele dza vhukoni ha vhagudi na uri u pulanisa hani u itela u tikedza thodea dza mugudi muṅwe na muṅwe.

Kha vha ite notsi dza mihumbulo yavho nga u funza na u guda ho fhambanaho kilaṣini yavho.

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?

Notsi dza mutshimbidzi

- ◆ Kha vha tshimbile vhukati ha zwigwada zwenezwi vhashelamulenzhe vha tshi khou haseledza u pulana na u lugisela u funza Kotara ya 3 Vhege ya 7–10 dza **Nyito ya 10**. Kha vha vha thuse nga u dzinginya nga u kunda dzikhaedu.
- ◆ Tshigwada tshiñwe na tshiñwe tshi kumedza mbuno dzatsho dza ndeme dza khaseledzo kha tshigwada tshihulwane.



Nyito ya 10

1. Tshigwadani tshavho, kha vha fhedzise themphuleithi ya u pulana ya Kotara ya 3 Vhege ya 4–6 (Thumetshedzo ya A).
2. Tshigwada tshavho tshi do kumedza manweledzo a khaseledzo ya u pulana havho kha zwiñwe zwigwada. Kha vha ñwale mbuno khulwane dza khaseledzo yavho kha bammbiri la filipitshati. Vha katele phindulo dza mbudziso dzi tevhelaho:
 - ◆ Ndi dzikhaedu dzifhio dzine vha lavhelela kha u thoma Vhege ya 7–10?
 - ◆ Vha nga tandulula hani inwe na inwe ya dzikhaedu idzi u itela u swikelela u thoma ho bvelelaho?
 - ◆ Nyito yo rangwaho phanda nga mugudisi i netshedza hani mugudisi zwikhala zwa u linga na u tikedza vhagudi?
 - ◆ Hone nyito dza tshigwada tshituku dzo diimisaho dzi a tendela ndowendowe yo linganelaho ya ndivho ntswa na zwikili?

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.

Notsi dza mutshimbidzi

- ◆ **U amba nga wekishopo:** Kha vha humbele vhashelamulenzhe u dzhia minetse i si gathi u amba nga ḑuvha na u fhenda *Bugu ya Mushumo ya Vhashelamulenzhe* yavho. Kha vha vha humbele u ņwala mbudziso dziñwe na dziñwe kana mahumbulwa u itela u kovhana na tshigwada tshihulwane. Kha vha humbele vhashelamulenzhe nga vhoṭhe u vha vhatu vho ḑinetshezaho u fhindula na u ņwala izwi kha filipitshati.
- ◆ Kha vha ṭuṭuwedze vhashelamulenzhe u engedza mahumbulwa mañwe na mbigela murahu zwi sa athu kovhiwa kha bogisi ḷa poswo.
- ◆ **Mushumo wa u ṭuwa nawo tshikoloni:** Kha vha vhale mushumo uyu. Kha vha vhudzise arali hu na zwiñwe zwi sa pfali zwine zwa ṭoḍa u ṭalutshedzwa.
- ◆ **U linga:** Kha vha phakhele khophi dza Fomo ya u Linga ya Wekishopo vha ri vhashelamulenzhe vha ḍadze idzo fomo
- ◆ **Wekishopo i tevhelaho:** Kha vha ṅee maḍuvha a wekishopo i tevhelaho vha vale wekishopo.



Nyito ya 11

U amba nga wekishopo: Kha vha dzhie minetse i si gathi u amba nga ḑuvha. Kha vha fhende *Bugu ya Mushumo ya Vhashelamulenzhe* yavho u ḍi hambudza nga zwe zwa kwamiwa. Kha vha ņwale mihumbulo yavho.

Kha vha kovhane zwe vha amba na tshigwada tshihulwane.



Mushumo wa u ṭuwa nawo tshikoloni

1. Kha vha shumise *Nyendedzi ya Nyito: Kotara ya 3* u pulana na u thoma Kotara ya 3 Vhege ya 7–10 dza Mbekanyamushumo ya Mbalo
2. Kha vha ite notsi dza zwe zwa shuma zwavhuḍi, zwe zwa si shume zwavhuḍi, na uri vho tandulula hani dzikhaedu dziñwe na dziñwe nga tshifhinga tsha u thoma havho Kotara ya 3 Vhege ya 7–10.
3. Kha vha ņwale mahumbulwa buguni ine vha i shumisa u itela u sedza mvelaphanda ya mugudi muñwe na muñwe (bugu ya u lavhelesa vhagudi). Kha vha shumise mutevhe wa u lavhelesa wa **'Kha vha ṭole uri vhagudi vha a kona u'** (kha iṭo tshibogisini) nga tshifhinga tsha nyito dzo rangwaho phanda nga mugudisi dziñwe na dziñwe u itela u endedza u lavhelesa havho na mahumbulwa.
4. Kha vha ḍe na bugu ya u lavhelesa vhagudi na notsi dze vha ita musi vha tshi khou amba nga ha u funza ha ḑuvha ḷiñwe na ḷiñwe kha wekishopo i tevhelaho.
5. Kha vha ḍe na khophi ya Kotara ya 3: Tsumbo ya Rekhodo ya u Linga hu yaho Phanda (u bva kha *Nyendedzi ya Nyito: Kotara ya 3*) kha wekishopo i tevhelaho.

Evaluation

Complete the Evaluation Form.

U linga

Kha vha ḁadze Fomo ya u Linga.

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				

THUMETSHEDZO YA A: THEMPHULEITHI YA U PULANA YA VHEGE NGA VHEGE YA KOTARA YA 3

Kotara ya 3: Pulane ya Nyito: Vhege ____

SIA LA MAGUDISWA:				
THERO:				
KHA VHA DIVHADZE NDIVHO NTSWA:				
NDOWEDZO:				
Nyito dza kilasi yothe		Nyito yo rangwaho phanda nga mugudisi	Nyito dza tshitshini tsha u shumela (nyito dza tshigwada tshituku tsho diimisaho)	
Duvha la 1			Nyito ya 1	
Duvha la 2			Nyito ya 2	
Duvha la 3			Nyito ya 3	
Duvha la 4			Nyito ya 4	
Duvha la 5				

Term 3: Activity Plan: Week ____

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

Kotara ya 3: Pulane ya Nyito: Vhege ____

SIA LA MAGUDISWA:				
THERO:				
KHA VHA DIVHADZE NDIVHO NTSWA:				
NDOWEDZO:				
Nyito dza kilasi yothe		Nyito yo rangwaho phanda nga mugudisi	Nyito dza tshitshini tsha u shumela (nyito dza tshigwada tshikuku tsho diimisaho)	
Duvha la 1			Nyito ya 1	
Duvha la 2			Nyito ya 2	
Duvha la 3			Nyito ya 3	
Duvha la 4			Nyito ya 4	
Duvha la 5				

Term 3: Activity Plan: Week ____

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

Kotara ya 3: Pulane ya Nyito: Vhege ____

SIA LA MAGUDISWA:				
THERO:				
KHA VHA DIVHADZE NDIVHO NTSWA:				
NDOWEDZO:				
Nyito dza kɩlasi yothe		Nyito yo rangwaho phanda nga mugudisi	Nyito dza tshɩtshini tsha u shumela (nyito dza tshigwada tshɩtuku tsho diimisaho)	
Duvha la 1			Nyito ya 1	
Duvha la 2			Nyito ya 2	
Duvha la 3			Nyito ya 3	
Duvha la 4			Nyito ya 4	
Duvha la 5				

Term 3: Activity Plan: Week ____

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

Kotara ya 3: Pulane ya Nyito: Vhege ____

SIA LA MAGUDISWA:				
THERO:				
KHA VHA DIVHADZE NDIVHO NTSWA:				
NDOWEDZO:				
Nyito dza kilasi yothe		Nyito yo rangwaho phanda nga mugudisi	Nyito dza tshilitshini tsha u shumela (nyito dza tshigwada tshituku tsho diimisaho)	
Duvha la 1			Nyito ya 1	
Duvha la 2			Nyito ya 2	
Duvha la 3			Nyito ya 3	
Duvha la 4			Nyito ya 4	
Duvha la 5				

Workshop 9 Evaluation Form

1. Did the workshop meet your expectations?

2. What did you learn in this workshop that helped you the most?

3. Was there anything that you did not like or had difficulty understanding?

4. How will you apply what you have learnt in your Grade R classroom?

5. Do you have any suggestions for improving further workshops?

Fomo ya u LINGA ya WEKISHOPO ya 9

1. Wekishopo yo swikelela ndavhelelo dzavho?

2. Ndi zwifhio zwe vha guda kha iyi wekishopo zwe zwa vha thusesa?

3. Ho vhuya ha vha na zwiṅwe zwe vha si zwi takalele kana zwe vha konḑelwa u zwi pfesesa?

4. Vha ḑo shumisa hani zwe vha guda ngomu kiḷasirumuni yavho ya Gireidi ya T?

5. Vha na zwine vha tama u dzinginya u itela u khwinisa wekishopo dzi tevhelaho?
