Nongonoko wa Antswiso wa Matematiki wa Giredi ya V

Grade R Mathematics Improvement Programme

Xiletelo xa Minongoti
Concept Guide

Xitsonga | English

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The Grade R Mathematics and Language Improvement Project is an initiative of the **Gauteng Department of Education** and its key partner, the **Gauteng Education Development Trust**.

The development and production of the training and classroom resources for the Grade R Mathematics and Language Improvement Project were made possible by generous project funding from the **United States Agency for International Development** and the **Zenex Foundation**.

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.

This edition of the mathematics materials has benefitted from collegial engagement with Wordworks colleagues and has been improved by their alignment with the materials of the Language Improvement Programme. It has been enriched by the work of officials of the Gauteng Department of Education's Early Childhood Development and Foundation Phase Curriculum Sub-Directorates at District and Provincial level who have made valuable contributions to the content of the materials and engaged constructively to ensure alignment with provincial policies, practices and values.

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- The *R-Maths* writing team: WCED Early Childhood Development officials, Cally Kuhne, Karen Kaimowitz, Bev Da Costa, Meryl Glaser, Sue Bailie, Sue Connolly, Sue Heese.

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Typesetting: Jenny Wheeldon
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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 ndzavisiso ku seketela madyondziselo na madyondzelo eka mivangu ya Afrika-Dzonga hinkwayo.

Nkandziyiso lowu wa timatheriyali ta matematiki wu vuyeriwile kusuka eka ku vulavurisana ka vatirhisani ka vatirhikulobye va Wordworks naswona wu antswisiwile hi mfambelaniso wa vona wa timatheriyali ta Nongonoko wa Antswiso wa Tindzimi. Wu fuwisiwile hi ntirho wa vakulukumba va Nhluvukiso wa Tindzumulo wa Ndzawulo ya Dyondzo ya Gauteng na Tindzawulotsongotsongo ta Kharikhulamu ya Xiyimo xa Masungulo leti nga eka levhele ya Xifundzatsongo na Xifundzakulu leti va nga endla vuhoxaxandla bya nkoka eka vundzeni bya timatheriyali naswona va tirhaneke na tona hi ndlela yo aka ku tiyisisa leswaku ku na mfambelano na tipholisi, maendlelo na mikhuvanene ya xifundzakulu.

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.
- Vatirhikulobye kusuka eka Wordworks, vatirhisani va xithekiniki lava nga eka Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V, eka ku tirhisana eka nhluvukiso wa timatheriyali.
- 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*: vakulukumba va Nhluvukiso wa Tindzumulo ta WCED, Cally Kuhne, Karen Kaimowitz, Bev Da Costa, Meryl Glaser, Sue Bailie, Sue Connolly, Sue Heese.

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Vuhundzuluxeri bya Xitsonga: Maurice Hlangwani
Vuhleri na vuhlayisisi bya Xitsonga: Gezani Chabalala
Vuhleri na vuhlayisisi bya Xinghezi: Ilse von Zeuner, Kathleen Sutton
Swifaniso: Jiggs Snaddon-Wood
Maveketelelo ya vuxokoxoko: Jenny Wheeldon
Dizayini ya le ndzeni: Magenta Media
Dizayini ya khavhara: Jacqui Botha

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Leswi nga endzeni

Foreword from the Head of Department

GAUTENG
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

GGT 2030
GROWING GAUTENG TOGETHER

Dear Teacher/Practitioner

Welcome to the training for the Grade R teachers/practitioners. The Gauteng Department of Education (GDE) has prioritised Early Childhood Development as its Strategic Goal 1. This is to ensure that we can lay a solid foundation and seamless transition of learners to Grade 1.

The Grade R Mathematics and Language Improvement Project has been developed to provide the much-needed classroom-based *support* for the Grade R teachers/practitioners in Gauteng. It is about classroom practices with exciting techniques and methodology most appropriate for Grade R teaching and learning. This is in response to a study that reported that 65% of children across South Africa have not mastered the skills required to be able to succeed in Literacy and Numeracy when entering Grade 1. This project is intended to support the Grade R teachers/practitioners to address this challenge.

The Department's expectation is that you are ready to learn and be a more empowered Grade R teacher/practitioner. Your commitment to the training process and thereafter the implementation of *lessons* learnt in *your* classroom, will contribute to the improvement of Grade R learner readiness for Grade 1.

We trust that this intervention will help enhance your potential, innovation and creativity as you lay an important foundation for learning for our children. This project would not have been possible without the support of our partners. The GDE is grateful for the support of the GEDT, Zenex Foundation and USAID who contributed to this initiative.

I trust you will learn a great deal from this training programme and improve the learning experience of the young children in your care.

Yours sincerely

Mr Edward Mosuwe
Head of Department: Gauteng Department of Education
3 June 2020

Rito ro rhanga kusuka eka Nhloko ya Ndzawulo

Eka Mudyondzisi/Mutirhi

Ha ku amukela eka vuleteri bya vadyondzisi/vatirhi va Giredi ya V. Ndzawulo ya Dyondzo ya Gauteng (Gauteng Department of Education (GDE)) yi rhangisile emahlweni Nhluvukiso wa Dyondzo ya Tindzumulo tanihi Xikongomelokulu xa Xiqhinga xa 1 xa yona. Leswi i ku tiyisisa leswaku hi kota ku aka masungulo yo tiya na ku cinca ko pfumala swikhutu eka vadyondzi lava yaka eka Giredi ya 1.

Phurojeke ya Antswiso wa Matematiki na Tindzimi ya Giredi ya V yi endleriwile ku nyika *nseketelo* lowu lavekaka swonghasi eka kamara ro dyondzela ra vadyondzisi/vatirhi va Giredi ya V eGauteng. Yi hi mayelana na mitolovelo ya le kamareni ro dyondzela leyi nga na maendlelo na matirhelo yo tsakisa lama ringaneleke swinene eka madyondziselo na madyondzelo ya Giredi ya V. Leswi swi hi mayelana na angulo eka ndzavisiso lowu vikeke leswaku 65% ta vana eAfrika-Dzonga hinkwayo a va si tokota vuswikoti lebyi lavekaka ku kota ku humelela eka Litheresi na Nyumeresi loko va nghena Giredi ya 1. Phurojeke leyi yi endleriwile ku seketela vadyondzisi/vatirhi va Giredi ya V ku ololoxa xiphiqo lexi.

Ndzawulo yi langutela leswaku u lunghekela ku dyondza na ku va mudyondzisi/mutirhi wa Giredi ya V loyi a havexerisiweke matimba swinene. Ku tinyiketa ka wena eka vuleteri na leswaku endzhaku u simeka *tidyondzo* leti dyondziweke eka kamara *ra wena* ro dyondzela, swi ta hoxa xandla eka ku antswisa ku lungheka ka vadyondzi va Giredi ya V eka Giredi ya 1.

Hi tshemba leswaku ku nghenelela loku ku ta pfuna ku ndlandlamuxa vuswikoti bya wena, ku tisa ku cinca kuntshwa na le ka vutumbuluxi bya wena loko u ri karhi u aka masungulo ya nkoka eka ku dyondza ka vana va hina. Phurojeke leyi a yi ta va yi nga humelelangi ku ri hava nseketelo wa vatirhisani va hina. GDE yi khensa nseketelo wa GEDT, Zenex Foundation na USAID lava va hoxeke xandla eka pfhumba leri.

Ndza tshemba leswaku u ta dyondza swo tala swinene eka nongonoko lowu wa vuleteri naswona u ta antswisa ntokoto wa ku dyondza ka vana lavatsongo lava nga eka nhlayiso wa wena.

Wa n'wina hi ku tshembeka

Ttn Edward Mosuwe

Nhloko ya Ndzawulo: Ndzawulo ya Dyondzo ya Gauteng

3 Khotavuxika 2020

SECTION 1

Grade R Mathematics Improvement Programme (Grade R Maths)

Introduction

Grade R Maths is an early maths programme for Grade R that is aligned to and extends the content of Grade R Mathematics in CAPS. The Grade R Maths programme:

- is designed to provide a framework for teaching and learning maths in Grade R
- is based on a set of teaching principles that encourage successful learning
- explains the concepts that are important for young children's maths development
- sequences Grade R maths content and gives practical ideas for the classroom
- gives teachers detailed guidance that supports their lesson planning.

The word 'maths' is used in different ways in this book. Here is how it is used and what each term means:

- **maths** is the body of knowledge called 'mathematics' that includes concepts, skills and applications
- **Grade R Mathematics** is the curriculum in the Curriculum and Assessment Policy Statement (CAPS)
- **Grade R Maths** is the name of this early maths programme for Grade R
- **maths in Grade R** is the kind of maths learning that takes place in Grade R.

In this guide, the word 'children' is used to talk about children before they enter Grade R. The word 'learner/s' is used to talk about children in Grade R.

Features of the *Concept Guide* include:

- information about teaching and learning maths
- **'In practice'** boxes that give examples of how the principles and ideas in this book could be used with or by learners
- **glossary** boxes that give the meaning of words that may be new or difficult to understand
- a glossary list of all the new words used in this book.

XIYENGE XA 1

Nongonoko wa Antswiso wa Matematiki wa Giredi ya V (*Grade R Maths*)

Manghenelo

Grade R Maths i nongonoko wa matematiki wa le masungulweni wa Giredi ya V lowu fambelanisiweke na ku ndlandlamukisa vundzeni bya Matematiki wa Giredi ya V eka XIPHOKHAMA. Nongonoko wa *Grade R Maths* wu:

- endleriwile ku nyika rimba ra ku dyondzisa na ku dyondza matematiki eka Giredi ya V
- simekiwile ehenhla ka xikatsa xa milawu ya madyondziselo leyi yi khutazaka madyondzelo lama humelelaka
- hlamusela minongoti leyi yi nga ya nkoka eka nhluvuko wa matematiki wa vana lavatsongo
- longoloxela vundzeni bya matematiki wa Giredi ya V naswona wu nyika mianakanyo yo endla eka kamara ro dyondzela
- nyika vadyondzisi ndzetelo lowu nga na vuxokoxoko lebyi seketelaka nkunguhato wa vona wa dyondzotsongo.

Rito ‘matematiki’ ri tirhisiwa hi tindlela to hambanahambana ebukwini leyi. Hi leswi leswi ri tirhisisiwaka xiswona na leswi theme rin’wana na rin’wana ri vulaka swona:

- **matematiki** i miri wa vutivi lowu wu katsaka minongoti, swikili na matirhiselo
- **Matematiki wa Giredi ya V** i kharikhulamu leyi nga eka Xitatimente xa Pholisi ya Kharikhulamu na Makambelelo (XIPHOKHAMA)
- ***Grade R Maths*** i vito ra nongonoko lowu wa matematiki wa le masungulweni eka Giredi ya V
- **matematiki eka Giredi ya V** i muxaka wa madyondzelo ya matematiki lama endlekaka eka Giredi ya V.

Eka xiletelo lexi, rito ‘vana’ ri tirhisiwa ku vulavula hi mayelana na vana va nga si nghena eka Giredi ya V. Rito ‘va/mudyondzi’ ri tirhisiwa ku vulavula hi mayelana na vana lava nga eka Giredi ya V.

Swihlawulekisi swa *Xiletelo xa Minongoti* swi katsa:

- vuxokoxoko hi mayelana na ku dyondzisa na ku dyondza matematiki
- mabokisi ya **‘Eka maendlelo’** lama ma nyikaka swikombiso swa hilaha milawu na mianakanyo leswi nga ebukwini leyi swi nga tirhisiwaka hakona na vadyondzi kumbe hi vadyondzi
- mabokisi ya **dlilosari** lama ma nyikaka nhlamuselo ya marito lama ma nga vaka ma ri mantshwa kumbe ma tika ku ma twisisa
- nxaxamelo wa dlilosari wa marito lamantshwa hinkwawo lama tirhisiweke ebukwini leyi.

Grade R Maths

There are four parts to Grade R Maths:

- the *Concept Guide*
- four *Activity Guides* – one for each school term – that provide Grade R teachers with weekly suggestions for teaching and learning maths
- a *Poster Book* with eleven posters
- a classroom *Resource Kit* with maths apparatus for individual and small group learning and teaching.

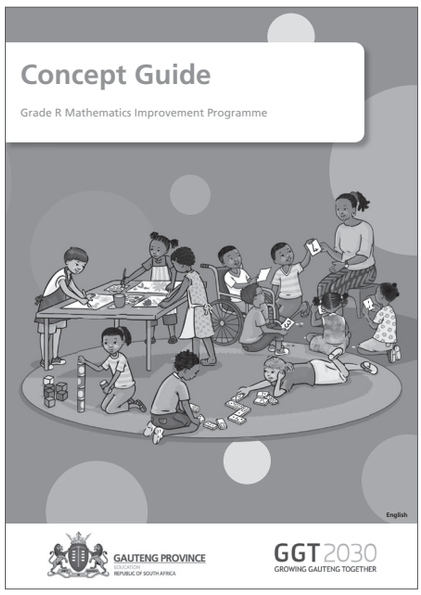


Figure 1 The *Concept Guide*

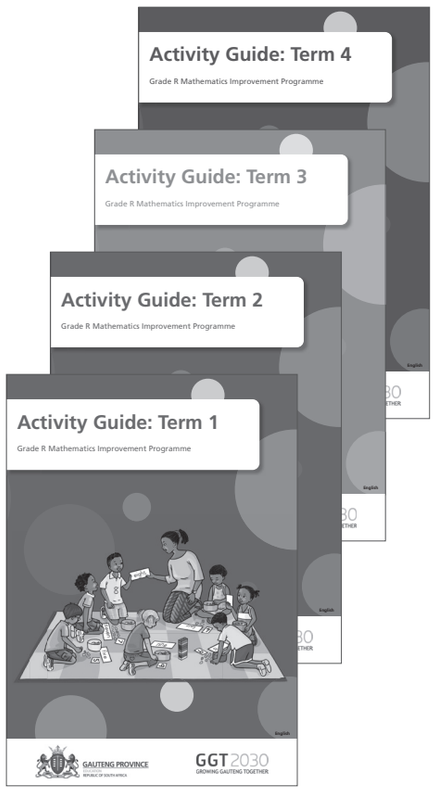


Figure 2 *Activity Guides* Term 1–4

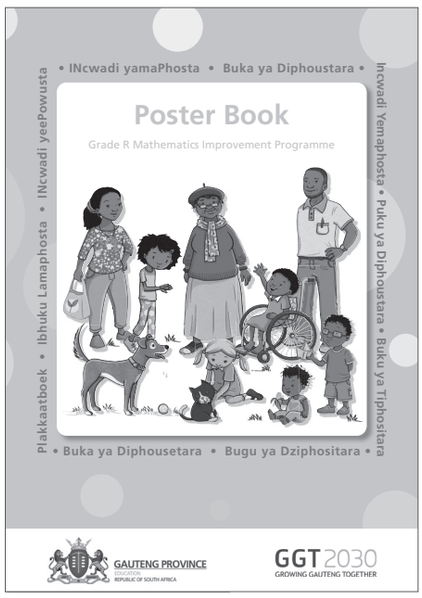


Figure 3 The *Poster Book*

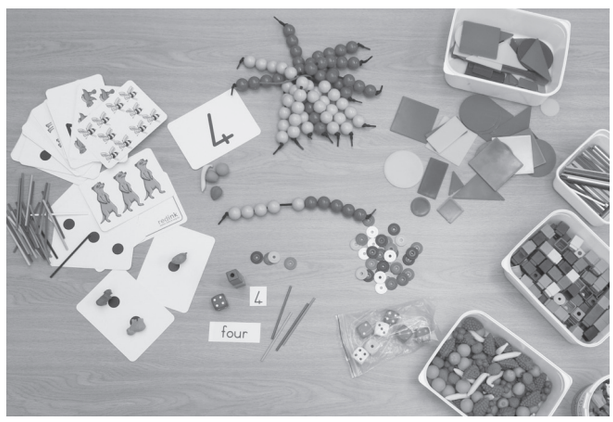


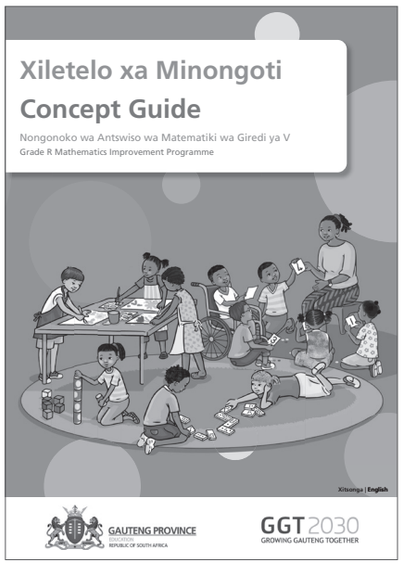
Figure 4 *Resource Kit*

You can find more information on each of the Grade R Maths components in this *Concept Guide*.

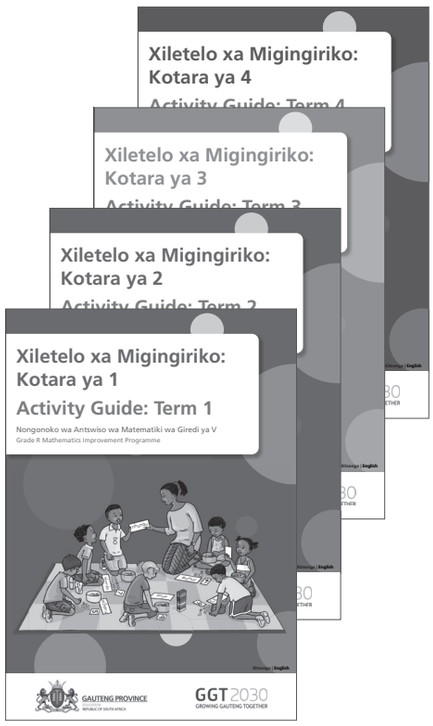
Grade R Maths

Ku na mune wa swiphemu eka *Grade R Maths*:

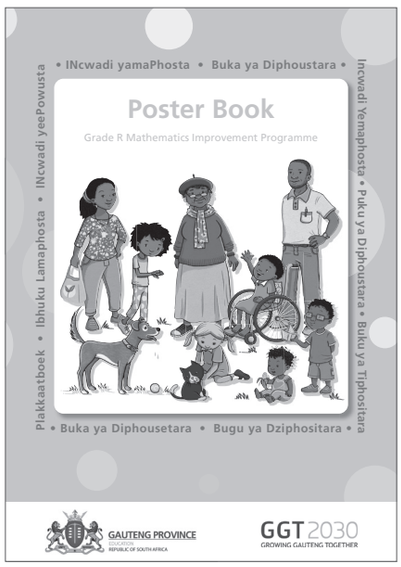
- *Xiletelo xa Minongoti*
- mune wa *Swiletelo swa Migingiriko* – xin'we xa kotara ya xikolo yin'wana na yin'wana – leswi swi nyikaka vadyondzisi va Giredi ya V swiringanyeto swa vhiki na vhiki swa ku dyondzisa na ku dyondza matematiki
- *Buku ya Tiphositara* leyi nga na khumen'we wa tiphositara
- *Khiti ya Swipfuno* ya le kamareni ro dyondzela leyi nga na switirhisiwa swa matematiki swa ku dyondza na ku dyondzisiwa ka munhu hi un'weun'we na ka mitlawa leyitsongo.



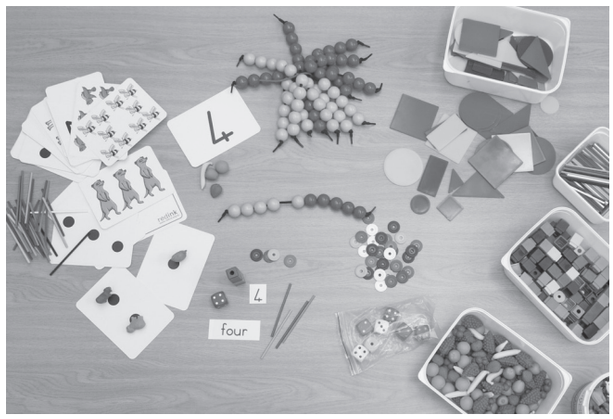
Xifaniso xa 1 *Xiletelo xa Minongoti*



Xifaniso xa 2 *Swiletelo swa Migingiriko* Kotara ya 1–4



Xifaniso xa 3 *Buku ya Tiphositara*



Xifaniso xa 4 *Khiti ya Swipfuno*

U nga kuma vuxokoxoko byo tala eka xin'wana na xin'wana xa swiphemutsongo swa *Grade R Maths* leswi nga eka *Xiletelo xa Minongoti*.

The guiding principles of teaching maths in Grade R

Grade R Maths encourages an approach to teaching and learning that is stimulating and motivating for learners. Learners will develop the knowledge and skills that they will build on in later grades. Education research in classrooms has highlighted a set of teaching **principles**, which contribute to successful learning. The Grade R Maths programme is built on eight of these principles.

GLOSSARY

principle
a general rule that is accepted to be true

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

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

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

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

THE EIGHT PRINCIPLES OF GRADE R MATHS

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

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

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

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

Figure 5 Principles of the Grade R Maths programme

Milawu yo letela ya ku dyondzisa matematiki eka Giredi ya V

Grade R Maths wu khutaza endlelo ra madyondziselo na madyondzelo lama ma nyanyulaka na ku hlohlotela eka vadyondzi. Vadyondzi va ta hluvukisa vutivi na swikili leswi va nga ta aka ehenhla ka swona eka tigiredi leti nga ta landzela. Ndzavisiso wa dyondzo etikamareni to dyondzela wu kombisile xikatsa xa **milawu** ya madyondziselo, leyi yi hoxaka xandla eka madyondzelo lama humelelaka. Nongonoko wa *Grade R Maths* wu akiwile ehenhla ka nhungu wa milawu leyi.

DLILOSARI

nawu
xiboho xo angarhela lexi xi amukeriwaka ku va ntiyiso

1. **Nawu wa mbangu.** Ku dyondza swi humelela eka swiyimo swo tivikana na ku va leswi faneleke.

8. **Nawu wo titoloveta.** Ku dyondza swi tiyisisiwa hi ku titoloveta swikili na vutivi byintshwa.

2. **Nawu wa nghingiriko.** Vadyondzi va fanele ku nghenelela hi ku kongoma eka endlelo ro dyondza-dyondzisa.

7. **Nawu wa nkatsahinkwavo.** Ku dyondza swi humelela eka mbangu laha munhu un'wana na un'wana a amukeriwaka, a katsiwaka, a khomiwa hindlela leyinene, a xiximiwaka naswona a kota ku teka xiave.

8
NHUNGU WA MILAWU YA *GRADE R MATHS*

3. **Nawu wa mitlangu.** Vana va dyondza kahle migingiriko yo tlanga va ri voxe na le ka migingiriko yo tlanga leyi leteriwaka.

6. **Nawu wa ndzetelo.** Ku dyondza swi humelela loko vadyondzisi va letela vadyondzi eka ku hluvukisa vutivi byintshwa.

5. **Nawu wa n'wangulano.** Ku dyondza swi humelela loko ku ri na mbulavurisano na avelano wa mianakanyo.

4. **Nawu wa levhele.** Vadyondzi va hundza hi le ka tilevhele to hambanahambana ta ntwisiso na nhluvuko.

Xifaniso xa 5 Milawu ya nongonoko wa *Grade R Maths*

Although these eight teaching principles are listed separately, they are all linked.

The next part of the *Concept Guide* takes you through the eight principles on which Grade R Maths is based. Each principle has:

- a definition
- an 'In practice' box
- more information about the principle.

1. The context principle

Definition

Learning takes place when a situation (or context) is meaningful to the learner. Very often, the best kinds of maths problems involve maths ideas that come from real-life situations. Learners find it easier to explore solutions to problems that they are able to relate to because of their life experiences.

In practice ...

There are opportunities for learning maths in almost all daily classroom and home activities. The challenge for teachers and parents is to be aware of these opportunities and to use them to build on what learners already know.

More about the context principle

Early maths at home

Young children's experiences at home and in outdoor play, lay the foundations for their understanding of important maths **concepts**.

Babies, toddlers and young children use their senses to learn about the world around them. They show an interest in basic shapes, create simple patterns and can learn to count before they come to school. They learn about the world as they talk, eat and play, while acquiring maths concepts at the same time. For example:

- When they try to fit things that are too big into their mouths, they are developing an understanding of size.
- When they use boxes and toilet roll inners to build imaginary cars, they are developing a sense of shape.
- When they try to lift an object that is too heavy to carry, they are beginning to understand the concept of mass.
- When they see similarities and differences between small collections of objects, they are matching, sorting and comparing.

Young children start to form ideas about maths concepts long before they are taught maths at school.

GLOSSARY

concept
an idea or thought. In other words, it cannot be touched. Maths concepts include number, counting, space, addition and subtraction.

Hambiloko milawu leya madyondziselo ya nhungu yi xaxametiwile ku hambana, yi na vuxaka hinkwayo.

Xiphemu lexi landzelaka xa *Xiletelo xa Minongoti* xi ku fambisa hi le ka milawu leya nhungu leyi *Grade R Maths* yi simekiweke ehenhla ka yona. Nawu wun'wana na wun'wana wu na:

- nhlamuselo
- bokisi ra 'Eka maendlelo'
- vuxokoxoko byo tala hi mayelana na nawu lowu.

1. Nawu wa mbangu

Nhlamuselo

Ku dyondza swi humelela loko ku ri na xiyimo (kumbe mbangu) lexi tivikanaka eka mudyondzi. Kotala swinene, mixaka ya kahle swinene ya swiphiqo swa matematiki yi khumba mianakanyo ya matematiki leyi yi taka kusuka eka swiyimo swa vutomi bya xiviri. Vadyondzi va kuma swi olova swinene ku valanga switshunxo swa swiphiqo leswi va kotaka ku swi yelanisa hikwalaho ka mitokoto ya vona ya vutomi.

Eka maendlelo ...

Ku na swivandlanene swa ku dyondza matematiki eka kwalomu ka kamara ro dyondzela ra siku rin'wana na rin'wana na le ka migingiriko ya le kaya. Ntlhontlho wa vadyondzisi na vatswari i ku tiva swivandlanene leswi na ku swi tirhisa ku aka ehenhla ka swona leswi vadyondzi se va swi tivaka.

Swo tala hi mayelana na nawu wa mbangu

Matematiki wa le masungulweni ekaya

Mitokoto ya vana lavatsongo ekaya na le ka ntlangu wa le handle ka muako yi vumba masungulo ya ntwisiso wa vona wa **minongoti** ya matematiki ya nkoka.

Tincece, tindzumulo na vana lavatsongo va tirhisa switwi swa vona ku dyondza hi mayelana na swivandla leswi nga ekusuhi na vona. Va komba ntsakelo eka swivumbeko swa masungulo, va tumbuluxa tipatironi to olova naswona va kota ku dyondza ku hlayela va nga si ta exikolweni. Va dyondza hi mayelana na swivandla leswi loko va ri karhi va vulavula, va dya na ku tlanga, va ri karhi va kuma minongoti ya matematiki hi nkarhi wun'we. Tanihi xikombiso:

- Loko va ringeta ku nghenisa swilo emilon'weni ya vona leswi swi nga swikulu kutlula mpimo, va le ku hluvukiseni ka ntwisiso wa sayizi.
- Loko va tirhisa mabokisi na swa le ndzeni ka ntsondzelo wa phepha ra le xihambukelweni ku aka mimovha yo anakanyiwa, va le ku hluvukiseni ka ntwisiso wa xivumbeko.
- Loko va ringeta ku tlakula nchumu lowu wu tikaka kutlula mpimo ku wu rhwala, va le ku sunguleni ka ku twisisa nongoti wa ntiko.
- Loko va vona ku yelana na ku hambana exikarhi ka mihlengelo leyitsongo ya michumu, va le ku pananiseni, va le ku aveni na ku va ku fananiseni ('pimanisa').

Vana lavatsongo va sungula ku vumba mianakanyo hi mayelana na minongoti ya matematiki khale va nga si sungula ku dyondza hi matematiki exikolweni.

DLILOSARI

nongoti
muanakanyo kumbe miehleketo. Hi marito man'wana, a swi nge koti ku khumbiwa. Minongoti ya matematiki yi katsa nomboro, ku hlayela, ndhawu, ku hlanganisa na ku susa.

The everyday activities of children at home are full of opportunities for early maths. For example:

- during daily routines, e.g. mealtimes, washing, getting dressed and putting things away
- when they use objects, e.g. putting lids onto plastic tubs and cutting with scissors
- as they play, e.g. when they share things, pretend to cook or pretend to drive a taxi
- when they draw and paint
- when they imitate adults counting.

These activities build children's self-confidence. At the same time, they develop their knowledge and understanding of the world around them.

Figure 6 Using daily activities to explore maths concepts

Young children's understanding of maths develops over time.

- They learn that numbers have an amount or quantity attached to them that does not change, e.g. when a three-year-old holds up three fingers to show the quantity 'three'.
- They may repeat a series of numbers, e.g. 'one, two, three, six, ten'. When they do this they are copying adults by using counting words without having a deeper understanding of what they mean.

As children play on their own and with other children, and as they **interact** with the adults around them, they start to develop ideas about the concepts of number, shape, space and measurement.

The concepts that children develop at home during their daily activities are sometimes called their 'everyday knowledge'. An example of this is when children put out enough bowls for everyone eating a meal and then put out one spoon per bowl. As they do this, they are learning about one-to-one matching.

GLOSSARY

interact
communicate with other people; do activities with other people

Migingiriko ya masiku hinkwawo ya vana ekaya yi tele swivandlanene swa matematiki wa le masungulweni. Tanihi xikombiso:

- hi nkarhi wa migingiriko ya siku na siku, xik. mikarhi ya swakudya, ku hlantswa, ku ambala na ku veka swilo
- loko va tirhisa michumu, xik. ku pfala swipfalo ehenhla ka timfuku ta pulasitiki
- loko va ri karhi va tlanga, xik. loko va avelana swilo, va encenyeta ku sweka kumbe va encenyeta ku chayela thekisi
- loko va dirowa kumbe va penda
- loko va encenyeta vatswatsi loko va hlayela.

Migingiriko leyi yi aka vutitshembi bya vana. Hi nkarhi wun'we, yi hluvukisa vutivi na ntwisiso wa vona wa swivandla leswi nga ekusuhi na vona.

Xifaniso xa 6 Ku tirhisa migingiriko ya siku na siku ku valanga minongoti ya matematiki

Ntwisiso wa vana lavatsongo wa matematiki wa kula hi ku famba ka nkarhi.

- Va dyondza leswaku tinomboro ti na ntsengo kumbe ntalo lowu fambelanaka na tona lowu wu nga cinciki, xik. loko n'wana wa malembe manharhu hi vukhale a khoma tintiho tinharhu ku komba ntalo wa 'nharhu'.
- Va nga ha vuyelela ntlhandlamano wa tinomboro, xik. 'n'we, mbirhi, nharhu, tsevu, khume.' Loko va endla leswi va encenyeta vatswatsi hi ku tirhisa marito yo hlayela va ri hava ntwisiso wo enta wa leswi ti vulaka swona.

Tanihiloko vana va tlanga va ri voxe na vana van'wana, na loko va ri karhi va **n'wangulana** na vatswatsi lava nga ekusuhi na vona, va sungula ku hluvukisa mianakanyo hi mayelana na minongoti ya nomboro, xivumbeko, ndhawu na mpimo.

DLILOSARI

n'wangulana
ku vulavurisana na vanhu van'wana; ku endla migingiriko na vanhu van'wana

Minongoti leyi vana va yi hluvukisaka ekaya eka migingiriko ya vona ya siku na siku mikarhi yin'wana yi vitaniwa 'vutivi bya masiku hinkwawo'. Xikombiso xa leswi hi loko vana va vekela swikambana swo enela swa munhu un'wana na un'wana loyi a dyaka swakudya kutani endzhaku ka swona va vekele lepula rin'we hi xikambana. Loko va ri karhi va endla leswi, va le ku dyondzeni hi mayelana na ku yelana ka xin'we-eka-xin'we.

Maths in the school context

Many people think maths is just about numbers and doing sums, but this is just one part of maths, called arithmetic. Maths actually includes many different concepts and skills. It also includes different ways of using these concepts and skills. These are called '**applications**'. So when we talk about maths we mean maths concepts, skills and applications.

Children use maths concepts every day even if they don't think of it as doing maths. They apply maths concepts when they fill a cup without it overflowing, know which container to use to fit in all the blocks, go shopping or say how many of something we have.

GLOSSARY

applications
different ways of using maths concepts and skills, e.g. checking your change in a shop, counting out your taxi fare, or dividing a packet of peanuts between three friends

Figure 7 We all use maths concepts in our daily lives – choosing the right size box.

At school, children build on this knowledge when, for example, they sort objects into groups and then compare the number of objects in each group. Then they learn to count using the correct sequence of numbers and use one-to-one correspondence to find the total number in a collection. This is called 'school knowledge'.

Everyday knowledge
comparing, sorting, matching, saying number names, learning about more/less, bigger/smaller, light/heavy

School knowledge
Symbols and words

Numbers, Operations and Relationships

Patterns, Functions and Algebra

Space and Shape (Geometry)

Measurement

Data Handling

Figure 8 The link between everyday knowledge and school knowledge

Matematiki eka mbangu wa xikolo

Vanhu vo tala va ehleketa leswaku matematiki wo va ntsena hi mayelana na tinomboro na ku endla tinhlayo kambe lexi xo va ntsena xiphemu xin'we xa matematiki, lexi vitaniwaka tinhlayo. Matematiki kahlekahle wu katsa minongoti na swikili swo hambanahambana swo tala. Wu tlhela wu katsa tindlela to hambanahambana ta ku tirhisa minongoti na swikili leswi. Leswi swi vitaniwa '**matirhiselo**'. Hikokwalaho loko hi vulavula hi mayelana na matematiki hi vula minongoti, swikili na matirhiselo ya matematiki.

Vana va tirhisa minongoti ya matematiki masiku hinkwawo hambiloko va nga swi ehleketi tanihi ku va le ku endleni ka matematiki. Va tirhisa minongoti ya matematiki loko va chela khapi va nga yi khapisi, va tiva leswaku i khontheni yihi va fanele ku yi tirhisa ku chela tibuloko hinkwato, va ya evhengeleni kumbe va vula leswaku i swilo swingani swa xin'wana hi nga na swona.

DLILOSARI

matirhiselo
tindlela to hambanahambana ta ku tirhisa minongoti na swikili swa matematiki, xik. ku kambisisa cinci ya wena evhengeleni, ku hlayela mali ya wena yo hakela thekisi, kumbe ku avanyisa phakiti ra timanga exikarhi ka vanghana vanharhu

Xifaniso xa 7 Hinkwerhu hi tirhisa minongoti ya matematiki evuton'wini bya hina bya siku na siku – ku hlawula bokisi ra sayizi leyi nga fanela.

Exikolweni, vana va aka ehenhla ka vutivi lebyi loko, tanihi xikombiso, va ava michumu ('minchumu') hi mitlawa kutani endzhaku ka swona va fananisa nhlayo ya michumu leyi nga eka ntlawa wun'wana na wun'wana. Kutani va dyondza ku hlayela hi ku tirhisa malongolokelo lama nga lulama ya tinomboro na ku yelana ka n'we-eka-n'we ku kuma nhlayo hinkwayo eka nhlengelo. Leswi swi vitaniwa 'vutivi bya le xikolweni'.

Vutivi bya masiku hinkwawo
ku fananisa, ku ava hi ku ya hi swihlawulekisi, ku pananisa, ku vula mavito ya tinomboro, ku dyondza hi mayelana na swo tala/ leswitsongo, leswikulu/leswitsongo, swo vevuka/swo tika

Vutivi bya le xikolweni
Mifungho na marito

Tinomboro, Tioparexini na Vuxaka

Tipatironi, Tifankixini na Alijebura

Ndhawu na Xivumbeko (Jometiri)

Mpimo

Matirhiselo ya Vuxokoxoko bya Tinhlayo

Xifaniso xa 8 Vuxaka exikarhi ka vutivi bya siku na siku na vutivi bya le xikolweni

When children arrive in Grade R, they come with their experiences as well as their understanding and ideas about the world. This is their everyday knowledge. Everyday knowledge will not be the same for all children as it depends on the child's family, community and culture. Everyday knowledge is sometimes called **prior knowledge** and teachers use it to build on what learners already know and can do.

GLOSSARY

prior knowledge
what learners know from before and can already do

In Grade R, learners should have the chance to explore, investigate and experiment with new ideas. They should also be encouraged to talk with their teacher and other learners about what they are doing and thinking. Learners need the right kind of teaching to help them:

- think and talk about their experiences using maths language
- build new maths knowledge
- deepen their understanding of maths
- develop a positive attitude to maths.

They need to engage in activities at home and at school that allow them to explore maths concepts, and to see maths as fun and enjoyable.

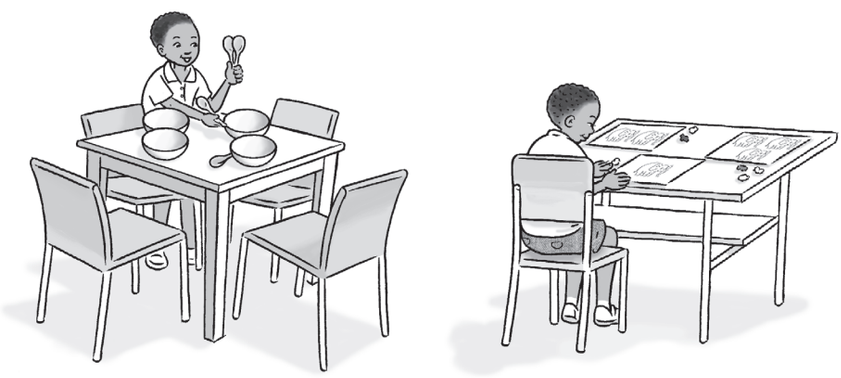


Figure 9 Counting and one-to-one matching at home and at school

Creating a maths learning environment

Teachers should create a classroom environment in which learners:

- feel safe and secure
- are confident enough to express themselves
- participate in all activities.

The physical environment for maths learning should include:

- resources (such as games, construction materials and puzzles) that are organised so that learners can see what is available and choose what they need to use
- opportunities to explore and investigate
- opportunities for learners to use materials to solve problems and record their solutions
- opportunities for learners to use maths language, like 'more', 'bigger than', 'corner' and also numbers

Loko vana va fika eka Giredi ya V, va ta na mitokoto xikan'we na ntwisiso wa vona na mianakanyo ya vona hi mayelana na misava. Leswi i vutivi bya vona bya masiku hinkwawo. Vutivi bya masiku hinkwawo a byi nga fani eka vana hinkwavo tanihileswi swi lawuriwaka hi ndyangu, muganga na mfuwo wa n'wana. Vutivi bya masiku hinkwawo mikarhi yin'wana byi vitaniwa **vutivi bya nkarhi lowu nga hundza** naswona vadyondzisi va byi tirhisa ku aka ehenhla ka leswi vadyondzi se va swi tivaka na ku kota ku swi endla.

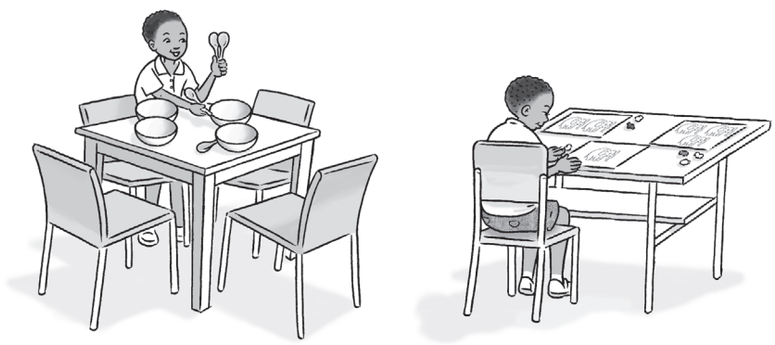
DLILOSARI

vutivi bya nkarhi lowu nga hundza
leswi vadyondzi va swi tivaka kusuka eka nkarhi lowu nga hundza na leswi se va nga swi endlaka

Eka Giredi ya V, vadyondzi va fanele ku kuma nkarhi wa ku valanga, ku lavisisa na ku kambisisa hi mianakanyo yintshwa. Va fanele ku tlhela va khutaziwa ku vulavula na mudyondzisi wa vona na vadyondzi van'wana hi mayelana na leswi va nga eku swi endleni na ku swi ehleketa. Vadyondzi va dinga muxaka lowu nga fanela wa madyondziselo ku va pfuna ku:

- ehleketa na ku vulavula hi mayelana na mitokoto ya vona ya ku tirhisa ririmi ra matematiki
- aka vutivi bya matematiki byintshwa
- tiyisa ntwisiso wa vona wa matematiki
- hluvukisa maehleketelo lamanene eka matematiki.

Ekaya na le xikolweni va fanele ku nghenelela eka migingiriko leyi yi va pfumelelaka ku valanga minongoti ya matematiki, na ku vona matematiki tanihi swilo swo tsakisa na ku tiphina hi swona.



Xifaniso xa 9 Ku hlayela na mpanano wa xin'we-eka-xinwe ekaya na le xikolweni

Ku tumbuluxa mbangu wa ku dyondza matematiki

Vadyondzisi va fanele ku tumbuluxa mbangu wa le kamareni ro dyondzela lowu eka wona vadyondzi va:

- titwaka va hlayisekile na ku sirheleleka
- titshembaka ku ringanela ku tipaluxa
- tekaka xiave eka migingiriko hinkwayo.

Mbangu wa xiviri wa ku dyondza matematiki wu fanele ku katsa:

- swipfuno (swo tanihi mitlangu, timatheriyali to aka na swiphazamiso) leswi lulamisiweke ku endlela leswaku vadyondzi va kota ku vona leswi swi nga kona na ku hlawula leswi va swi lavaka ku swi tirhisa
- swivandlanene swa ku valanga na ku lavisisa
- swivandlanene swa vadyondzi ku tirhisa timatheriyali ku ololoxa swiphiqo na ku rhekoda switshunxo swa vona
- swivandlanene swa vadyondzi ku tirhisa ririmi ra matematiki, ku fana na 'tala', 'kulu kutlula', 'khona' na tinomboro

- activities that involve **observing**, **matching**, **comparing**, **sorting** and **ordering**.

In practice ...

- Set up a maths-rich area in your classroom. Use a table against a wall so that labels, pictures and objects can be displayed and discussed.
- Arrange the weather chart, calendar, number line (number washing line) and number friezes in this area and use these for daily discussions.
- Display the learners' work in this area.
- Encourage the learners to bring items from home for discussion. Add these to the display table and give the learners who brought them an opportunity to talk about them.

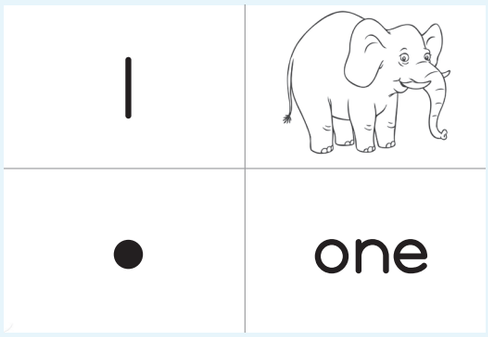


Figure 10 Number frieze

Figure 11 The maths area

2. The activity principle

Definition

The activity principle means learning by doing things yourself. Learners should be actively involved in their own learning. Learning maths in Grade R should consist of enjoyable, hands-on activities that involve everyday objects and meaningful experiences. Wherever possible the activities should provide learners with the opportunities to use their whole bodies and their senses, especially sight, hearing and touch.

GLOSSARY

observing
using our senses to find out about objects, events and attitudes. We need to observe to gather information about the world, e.g. looking and listening carefully to what is happening around us.

matching
identifying the same attribute in two or more objects, e.g. all the yellow objects. Matching is an important skill for learning one-to-one correspondence.

comparing
looking for similarities and differences between two or more objects, e.g. 'these are both animals, but one of them is blue and the other one is red'. Comparing is about finding the relationship between objects based on specific features. This skill leads to the ability to classify objects.

sorting
finding things that are the same, or alike, and grouping them by specific features. First sort by one feature, such as colour, e.g. 'all the green shapes'. Then sort by two features, such as colour and size, e.g. 'all the small, green shapes'.

ordering
lining up three or more objects or events in a sequence, e.g. the daily classroom routine, the learners' morning routine ('after I wake up I get out of bed, wash my face, eat my breakfast …') or the events in a story

- migingiriko leyi yi katsaka **ku xiya**, **ku pananisa**, **ku fananisa**, **ku ava** na **ku xaxameta**.

Eka maendlelo ...

- Lulamisa ndhawu leyi nga fuwa hi matematiki ekamareni ra wena ro dyondzela. Tirhisa tafula ri khumbana na khumbi ku endlela leswaku tilebulu, swifaniso na michumu swi kota ku kombisiwa na ku kaneriwa.
- Lulamisa chati ya ta maxelo, khalendara, layini ya tinomboro (mugiva wa tinomboro) na xipendiwankhaviso xa tinomboro eka endhawini leyi kutani u tirhisa leswi eka mikanelo ya siku na siku.
- Kombisa ntirho wa vadyondzi endhawini leyi.
- Khutaza vadyondzi ku tisa michumu kusuka ekaya leswaku yi ta kaneriwa. Engetela leswi eka tafula ro kombisa kutani u nyika vadyondzi lava va teke na swona xivandlanene xa ku vulavula hi mayelana na swona.

I	
•	n'we

Xifaniso xa 10 Xipendiwankhaviso xa tinomboro

Xifaniso xa 11 Xiyenge xa matematiki

2. Nawu wa nghingiriko

Nhlamuselo

Nawu wa nghingiriko swi vula ku dyondza hi ku endla swilo hi wexe. Vadyondzi va fanele ku khumbeka hi ku gingirika eka ku dyondza ka vona vini. Ku dyondza matematiki eka Giredi ya V swi faneleke ku vumbiwa hi migingiriko yo endla leyi ku tiphiniwaka, leyi yi khumbaka michumu ya masiku hinkwawo na mitokoto leyi nga na nkoka. Kwihi na kwihi laha swi kotekaka migingiriko leyi yi fanele ku nyika vadyondzi swivandlanene ku tirhisa miri ya vona na switwi swa vona, ngopfungopfu ku vona, ku twa na ku khumba.

DLILOSARI

ku xiya
ku tirhisa switwi swa hina ku kumisisa hi mayelana na michumu, swiendleko na maehleketelo. Hi fanele ku xiya ku hlengeleta vuxokoxoko hi mayelana na misava, xik. ku languta na ku yingisela hi vukheta eka leswi swi humelelaka ekusuhi na hina.

ku pananisa
ku kuma xihlawulekisi xo fana hi michumu mimbirhi kumbe kutlula, xik. michumu hinkwayo ya xitshopana. Ku pananisa i xikili xa nkoka xa ku dyondza ku yelana ka xin'we-eka-xin'we.

ku fananisa
ku lava leswi fanaka na leswi hambanaka exikarhi ka michumu mimbirhi kumbe kutlula, xik. 'leswi haswimbirhi i swiharhi kumbe xin'we xa swona i xa wasi kasi lexin'wana i xo tshwuka'. Ku fananisa swi hi mayelana na ku kuma vuxaka exikarhi ka michumu hi ku ya hi swihlawulekisi swo kongoma. Xikili lexi xi yisa eka vuswikoti bya ku ntlawahata michumu.

ku ava
ku kuma swilo leswi swi fanaka, kumbe swi yelanaka, na ku swi ntlawahata hi swihlawulekisi swo kongoma. Rosungula ava hi xihlawulekisi xin'we, xo tanihi muhlovo, xik. 'swivumbeko swa rihlaza hinkwaswo'. Endzhaku ka swona ava hi swihlawulekisi swimbirhi swo tanihi muhlovo na sayizi, xik. 'swivumbeko swa rihlaza, leswitsongo hinkwaswo'.

ku xaxameta
ku forisa michumu kumbe swiendleko swinharhu kumbe kutlula eka landzelelana, xik. ntirho wa le kamareni ro dyondzela wa siku na siku, ntirho wa nimixo wa siku na siku wa vadyondzi ('endzhaku ka loko ndzi pfukile ndzi xika emubedweni, ndzi hlamba xikandza xa mina, ndzi dya mfihlulo wa mina …') kumbe swiendleko eka xitori

Grade R learners should learn to count and order numbers through songs and rhymes, using actions and big movements, such as clapping, jumping and stomping to represent numbers as they count. Rote counting, copying numbers from the board and writing number symbols between lines with a pencil are not the best way to learn about numbers.

Learners should physically look for and pack out collections of objects that they can count and label with number word and symbol cards. They should write number symbols in the sand, form them using Plasticine, paint them, or trace them on their friend's back. This approach is aligned with emergent writing and links the formation of the number symbol with the number name.

When introducing a new number, it is a good idea to connect the number name, symbol, physical actions and collections of objects through a story. This can be done by encouraging learners to count objects in a picture, or to recall the number of things in a story, or they can clap, jump or show their fingers to represent the number in a story.

In practice ...

The teacher does the following:

- Plans hands-on activities that are suitable for the learners' ages, levels of development and their interests.
- Makes connections between what the learners already know and can do, and the new ideas, language, concepts and/or skills that are to be learnt.

The learners:

- are free to experiment, investigate and ask questions
- together, share ideas and ask questions.

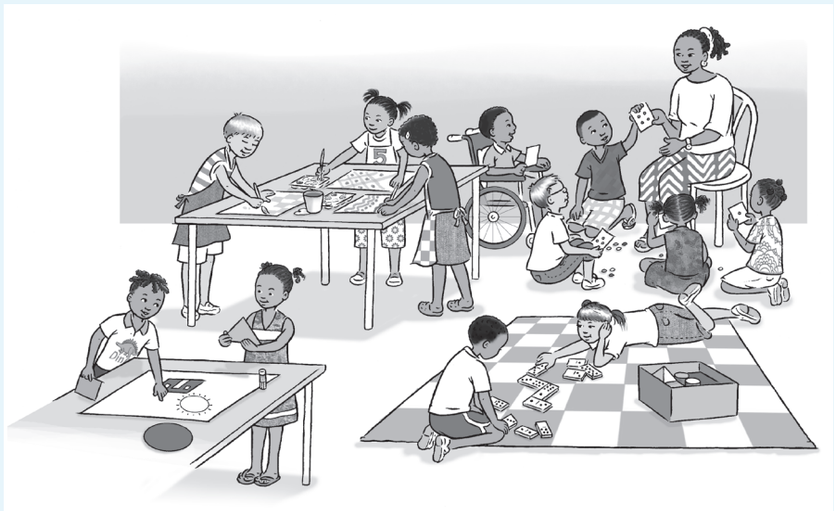


Figure 12 Children learn in hands-on activities.

Vadyondzi va Giredi ya V va fanele ku dyondza ku hlayela na ku longoloxa tinomboro hi ku tirhisa tinsimu na tirhayimi, va ri karhi va tirhisa swiendlo na mifambofambo leyikulu, yo tanihi ku phokotela, ku tlula na ku gima ku yimela tinomboro loko va ri karhi va hlayela. Ku hlayela ko bela enhlokweni, ku kopunula tinomboro kusuka ebodweni na ku tsala mifungho ya tinomboro exikarhi ka tilayini hi pensele a hi ndlela ya kahle swinene ya ku dyondza hi mayelana na tinomboro.

Vadyondzi va fanele ku lava hi voxe na ku paka mihlengelo ya michumu leyi va nga yi hlayelaka na ku yi lebula hi rito ra nomboro na makhadi ya mifungho. Va fanele ku tsala mifungho ya tinomboro emisaveni, va ti vumba hi ku tirhisa vumba, va ti penda, kumbe va ti landzelerisa enhlaneni wa munghana wa vona. Endlelo leri ri fambelanisiwa na ku tsala ka masungulo naswona ri hlanganisa ku vumbiwa ka mfungho wa nomboro na vito ra nomboro.

Loko ku tivisiwa nomboro yintshwa, i mianakanyo ya kahle ku hlanganisa vito ra nomboro, mfungho, swiendlo swa miri na mihlengelo ya michumu hi ku tirhisa xitori. Leswi swi nga endliwa hi ku khutaza vadyondzi ku hlayela michumu leyi nga exifanisweni, kumbe ku tsundzuka nhlayo ya swilo leswi swi nga exitorini, kumbe va nga phokotela, va tlula kumbe va komba tintiho ta vona ku yimela nomboro leyi nga exitorini.

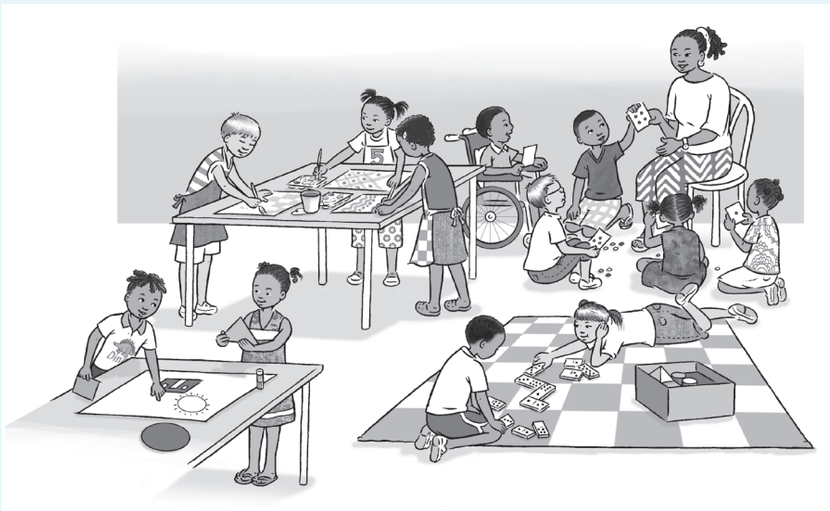
Eka maendlelo ...

Mudyondzisi u endla leswi landzelaka:

- U kunguhata migingiriko yo endla leyi yi ringanelaka malembe ya vadyondzi hi vukhale, tilevhele ta vukulu bya vona na mitsakelo ya vona.
- U vumba vuxaka exikarhi ka leswi vadyondzi se va swi tivaka na ku swi endla, na mianakanyo leyintshwa, ririmi, minongoti na/kumbe swikili leswi swi faneleke ku dyondziwa.

Vadyondzi:

- va tshunxekile ku kambisisa, ku lavisisa na ku vutisa swivutiso
- va ri swin'we, va avelana mianakanyo na ku vutisana swivutiso.



Xifaniso xa 12 Vana va dyondza eka migingiriko yo endla.

3. The play principle

Definition

Play consists of activities that are enjoyable and that promote a child's growth and development. Play has behavioural, social, physical, cognitive and emotional rewards. Play allows learners to be actively involved in their own learning and exploration of their environment. Learning in Grade R should consist of enjoyable, hands-on activities and experiences that make use of many concrete objects and **symbols**.

GLOSSARY

symbols
things that represent or stand for something else, such as a number symbol, logo or road sign

Learning through play

For children, learning and play are not separate activities. Play can mean many things, such as outdoor physical activities; playing with sand or water; pretend play with friends or alone; playing with blocks and construction toys; or playing listening games, guessing games or card games. Although some play activities need extra time and resources, children often enjoy playing with everyday objects and simple home-made materials. Play is how children learn at home and at school. It is not something that learners do only in their 'free time' or when a teacher is not around.

Learners need many opportunities to:

- explore their environment using their senses, e.g. physical activities done outdoors, such as climbing and running, or games with rules that have to be followed, such as hopscotch and ball games
- investigate and solve problems, e.g. using construction materials to make a tower, or using water or sand to fill containers
- practise what they already know or can do, e.g. playing structured games, such as snakes and ladders or dominoes.

Five types of play

Researchers have identified five types of play that can be seen in all cultures and that support the physical, social, emotional and cognitive development of a child.

- **Physical play** includes active exercise, fine motor practice and rough-and-tumble play. It is important for gross and fine motor coordination and for building strength and endurance.
- **Play with objects** includes exploring, investigating and experimenting with different obejcts in their world. This develops their thinking and problem-solving skills.
- **Symbolic play** is when children use a toy, object, picture, drawing or other mark-making to represent real-life objects.
- **Pretence and socio-dramatic play** involves dressing-up and role-playing. This promotes cognitive and social development and helps children to manage their own behaviour and thinking.
- **Games with rules** encourage children to follow the rules of a game, and to learn to share and take turns as well as help one another.

3. Nawu wa mitlangu

Nhlamuselo

Ku tlanga swi vumbiwa hi migingiriko leyi ku tiphiniwaka na ku va leyi kondletelaka ku kula na nhluvukiso wa n'wana. Ntlangu wu na swikhenso swa matikhomelo, swa ku hanyisana, swa le mirini, swa le miehleketweni na le moyeni. Ntlangu wu pfumelela vadyondzi ku khumbeka hi ku gingirika eka ku dyondza ka vona vini na mbalango wa mbangu wa wona. Ku dyondza eka Giredi ya V swi fanele ku vumbiwa hi migingiriko yo endla, leyi ku tiphiniwaka na mitokoto leyi yi tirhisana michumu yo khomeka na **mifungho**.

DLILOSARI

mifungho
swilo leswi swi yimelaka kumbe ku va ematshan'weni ya xin'wana xo karhi, xo tanihi mfungho wa nomboro, logo kumbe mfungho wa le gondzweni

Ku dyondza hi ku tirhisa ntlangu

Eka vana, ku dyondza na ku tlanga a hi migingiriko yo hambana. Ntlangu swi nga vula swilo swo tala, swo tanihi migingiriko ya le handle ka miako ya ku tirhisa swirho swa miri; ku tlanga hi misava kumbe mati; ku encenyeta ku tlanga na vanghana kumbe a ri yexe; ku tlanga hi tibuloko na switlangiso swo aka; kumbe ku tlanga mitlangu yo yingisela, mitlangu yo vhumba kumbe mitlangu ya makhadi. Hambileswi migingiriko ya ku tlanga yin'wana yi lavaka nkarhi wo engetela na swipfuno, vana kotala va tiphina hi ku tlanga hi michumu ya masiku hinkwawo na timatheriyali to olova to endliwa ekaya. Ku tlanga i madyondzelo ya vana ekaya na le xikolweni. A hi swin'wana leswi vadyondzi va swi endlaka ntsena eka 'nkarhi wo tshunxeka' kumbe loko mudyondzisi a nga ri kona.

Vadyondzi va lava swivandlanene swo tala ku:

- valanga mbangu wa vo hi ku tirhisa switwi swa vona, xik. migingiriko yo tirhisa swirho swa miri leyi endliwaka ehandle ka miako yo tanihi ku khandziya na ku tsutsuma, kumbe mitlangu leyi nga na milawu leyi yi faneleke ku landzeleriwa yo tanihi openi na mitlangu ya bolo
- lavisisa na ku ololoxa swiphiqo, xik. ku tirhisa timatheriyali to aka ku endla xihondzo, kumbe ku tirhisa mati kumbe sava ku chela ti khontheni
- titoloveta leswi se va swi tivaka kumbe va nga swi endlaka, xik. ku tlanga mitlangu leyi nga na xivumbeko yo tanihi tinyoka na malerha kumbe tidomino.

Ntlhanu wa mixaka ya ntlangu

Valavisisi va kumile ntlhanu wa mixaka ya ntlangu leyi yi nga voniwa eka mifuwo hinkwayo na ku va leyi yi seketelaka nhluvukiso wa le mirini, wa le vanhwini, wa le moyeni na le miehleketweni ya vana.

- **Ntlangu wa swirho swa miri** wu katsa vutiolori, vutitoloveti bya swirho swa miri leswitsongo na ntlangu wa ku hlongorisana na ku lwa. I swa nkoka eka ntirhisano wa swirho swa miri na leswikulu hinkwaswo na ku aka matimba na nkondzelelo.
- **Ku tlanga hi michumu** swi katsa ku valanga, ku lavisisa na ku kambisisa hi michumu yo hambanahambana leyi nga eswivandleni swa vona. Leswi swi ndlandlamuxa swikili swa vona swa ku ehleketa na swa ku ololoxa swiphiqo.
- **Ntlangu wa vuyimeri** hi loko vana va tirhisa xitlangiso, nchumu, xifaniso, xidirowiwa kumbe ku endla mfungho wun'wana ku yimela michumu ya vutomi bya xiviri.
- **Ntlangu wo encenyeta na wo anakanya swiyimo swa vanhu** wu katsa ku ambala na ku tlanga ko encenyeta. Leswi swi kondletela nhluvukiso wa miehleketo na ku hanyisana na ku pfuna vana ku lawula matikhomelo na miehleketo ya vona vini.
- **Mitlangu leyi nga na milawu** yi khutaza vana ku landzelela milawu ya ntlangu, na ku dyondza ku avelana na ku cincana xikan'we na ku pfunana.

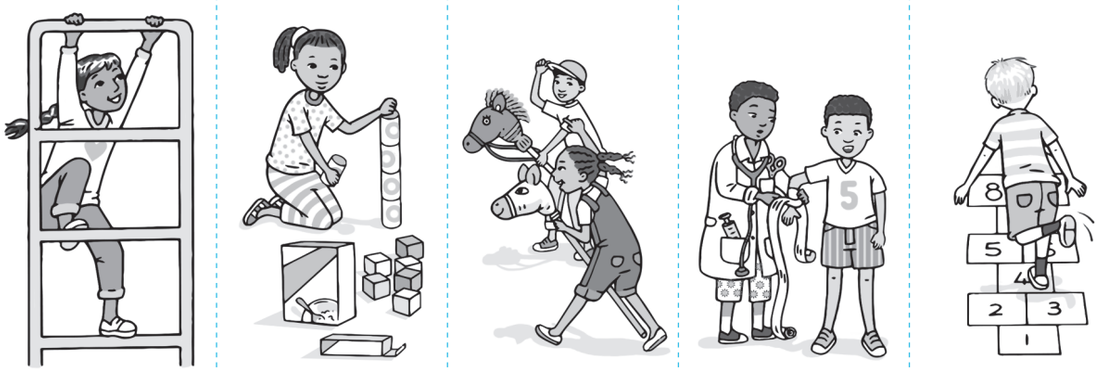


Figure 13 Types of play

The play-based approach

The play-based approach to teaching and learning recognises that at times children learn best from free-play activities which are initiated and directed by the child without adult involvement. At other times learners learn best from guided-play activities that are directed by the teacher for the whole class or small groups. A well-planned teaching and learning programme should include a balance of all the different types of play activities.

Learning maths concepts through play

Play often involves children taking on adult roles. For example, they might imitate adults preparing food, or a pilot flying an airplane, or a teacher teaching a class. In these games, they often use objects in their environment and pretend that they are other things, e.g. a wooden construction block 'becomes' a chopping board for chopping vegetables. In this kind of play, children use one object to 'stand for' or represent another one.

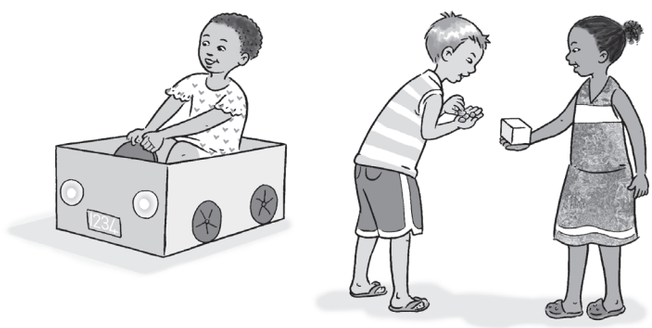


Figure 14 A cardboard box can represent a car, a wooden block can represent an apple and stones can represent money.

When children play and draw they use objects and pictures to represent real-life things. This is the beginning of learning that symbols can represent real things. They learn:

- that a drawing of two people can represent two real people.
- that symbols can represent other things, e.g. '2' stands for two things and this can be two of anything.

Ntlangu wa swirho swa miri

Ku tlanga hi michumu

Ntlangu wa mifungho

Ntlangu wo encenyeta na wo anakanya swiyimo swa vanhu

Mitlangu leyi nga na milawu

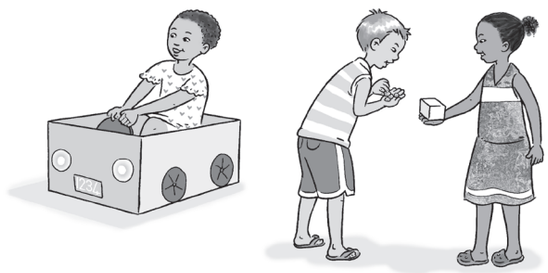
Xifaniso xa 13 Mixaka ya ntlangu

Endlelo leri simekiweke eka ntlangu

Endlelo leri simekiweke eka ntlangu ra madyondziselo na madyondzelo ri lemuka leswaku hi mikarhi vana va dyondza kahle swinene eka migingiriko yo tlanga va tshunxekile leyi yi sunguriwaka na ku lawuriwa hi vana ku ri hava ku nghenelela ka ntswatsi. Eka mikarhi yin'wana vadyondzi va dyondza kahle swinene kusuka eka migingiriko yo tlanga leyi leteriwaka leyi lawuriwaka hi mudyondzisi ya ntlawa hinkwawo kumbe mitlawa leyitsongo. Nongonoko wa madyondziselo na madyondzelo lama kunguhatiweke kahle wu fanele ku katsa ndzinganiso wa mixaka yo hambanahambana hinkwayo ya migingiriko ya ku tlanga.

Ku dyondza minongoti ya matematiki hi ku tirhisa ntlangu

Ntlangu kotala wu katsa vana lava va tekaka swiave swa vatswatsi. Tanihi xikombiso, va nga ha encenyeta vatswatsi va ri karhi va lulamisa swakudya, kumbe muhahisi loyi a hahisa xihahampfhuka, kumbe mudyondzisi loyi a dyondzisaka tlilasi. Eka mitlangu leyi, kotala va tirhisa michumu leyi nga eka mbangu wa vona kutani va encenyeta leswaku yona i swilo swin'wana, xik. buloko yo aka ya mhandzi yi 'hundzuka' buloko yo tsemelelela ya ku tsemelelela miroho. Eka muxaka lowu wa ntlangu, vana va tirhisa nchumu wun'we ku 'yimela' kumbe wu va ematshan'weni ya wun'wana.



Xifaniso xa 14 Bokisi ra khadibodo ri nga yimela movha, buloko ya mhandzi yi nga yimela apula naswona maribye ma nga yimela mali.

Loko vana va tlanga na ku dirowa va tirhisa michumu na swifaniso ku yimela swilo swa vutomi bya xiviri. Lama i masungulo ya ku dyondza leswaku mifungho yi nga yimela swilo swa xiviri. Va dyondza:

- leswaku xidirowiwa xa vanhu vambirhi xi nga yimela vanhu vambirhi va xiviri.
- leswaku mifungho yi nga yimela swilo swin'wana, xik. '2' yi yimela swilo swimbirhi naswona leswi swi nga va swimbirhi swa xilo xihi kumbe xihi.

- about abstract thoughts and ideas, e.g. printing with a block and talking about the printed shape helps children to recognise the properties of a square.
- how things **relate** to each other, e.g. some containers fit into each other, some blocks can support other blocks, construction toys have some pieces that fit together, but not all of them do.

GLOSSARY

relate
how objects and ideas are connected to each other

There are many other play activities that promote maths learning. Here are some examples.

- When learners use different-sized containers, sand and water to build sandcastles, they explore the concepts of capacity (more/less), size (big/small) and quantity (many/fewer).
- Games, such as hopscotch and skipping, encourage children to use counting and to recognise patterns.
- Children can explore the shape and size of objects by putting objects (such as boxes and balls) in a 'feely bag', choosing one object and describing it.

In practice ...

Plan activities that interest learners and make them curious about maths.

- Encourage fantasy play by starting a game, e.g. place chairs in a row to make a train. Then ask a learner to be at the front as the train driver or on the second or third chair as a passenger. In this way, learners have fun, but also learn concepts such as position and number order.
- Join in and share activities with learners as they play. Show your enjoyment and involvement by thinking aloud and talking about what is happening in the activity, e.g. 'I filled three cups with water – one, two, three. Now I've filled one more so, look, there are four. Look how neatly they are lined up!' Discussion is an important way to teach maths language to children.
- Notice how learners talk about their ideas about counting, combining and sharing during their play, and repeat their findings back to them, e.g. 'You counted out five red beads and then counted out five blue beads. Let's count how many beads you have. That's right, ten beads.'
- Help children to think about symbols during fantasy play. Suggest how one thing might represent another, e.g. 'You could turn that table upside down and use it as your boat.'

4. The level principle

Definition

Skills and concepts build on one another. This is called **developmental progression**. Learners build their knowledge on what they already know and can already do. Good teaching depends on the teacher first finding out what learners already know and understand, and then using activities and everyday situations to build on that to help them learn new knowledge and skills.

GLOSSARY

developmental progression
order in which skills and concepts build on one another

- hi mayelana na miehleketo yo anakanyiwa, xik. ku pirinta hi buloko na ku vulavula hi mayelana na xivumbeko lexi pirintiweke swi pfuna vana ku lemuka swihlawulekisi swa xikwere.
- hilaha swilo swi nga na ku **xakelana** hakona, xik. tikhontheni tin'wana ta nghenelana, tibuloko tin'wana ta seketelana, switlangiso swo aka swi na swiphemu leswi nghenelanaka kambe a hi hinkwaswo swa swona swi nghenelanaka.

DLILOSARI

xakelana
hilaha michumu na mianakanyo swi nga na vuxaka hakona

Ku na migingiriko ya ku tlanga yin'wana leyi yi kondletelaka ku dyondza matematiki. Hi leswi swikombiso swin'wana.

- Loko vadyondzi va tirhsisa tikhontheni leti nga na tisayizi to hambanahambana, misava na mati ku aka swigodlo swa misava, va valanga minongoti ya vundzeni (tala/ntsongo), sayizi (nkulu/ntsongo) na ntalo (tala/ntsongo ngopfu).
- Mitlangu yo tanihi hi openi na ku thamuka yi khutaza vana ku tirhisa nhlayelo na ku lemuka tipatironi.
- Vana va nga valanga xivumbeko na sayizi ya michumu hi ku chela michumu (yo tanihi mabokisi na tibolo) endzeni ka 'bege yo twa', va hlawula nchumu wun'we kutani va wu hlamusela.

Eka maendlelo ...

Kunguhata migingiriko leyi tsakisaka vadyondzi na ku va endla va handza vutivi hi mayelana na matematiki.

- Khutaza ntlangu wa norho hi ku sungula ntlangu, xik. ku veka switulu hi nxaxamelo ku aka xitimela. Kutani u kombela mudyondzi ku va emahlweni tanihi muchayeri wa xitimela kumbe eka xitulu xa vumbirhi kumbe xa vunharhu tanihi mukhandziyi. Hi ndlela leyi, vadyondzi va tiphina kambe va tlhela va dyondza minongoti yo tanihi xiyimo na malongolokelo ya tinomboro.
- Tikatse kutani u avelana migingiriko na vadyondzi loko va ri karhi va tlanga. Komba ku tiphina ka wena na ku khumbeka hi ku ehleketa ehenhla na ku vulavula hi mayelana na leswi swi nga eku humeleleni eka nghingiriko lowu, xik. 'Ndzi chele tikhapi tinharhu hi mati – n'we, mbirhi, nharhu. Sweswi ndzi chele yin'we yo engetela hikokwalaho, vonani, ku na mune. Langutani hilaha ti foleke hakona ti saseka!' Nkanelo i ndlela ya nkoka ya ku dyondzisa vana ririmi ra matematiki.
- Vona hilaha vadyondzi va vulavulaka hi mayelana na mianakanyo ya vona hi mayelana na ku hlayela, ku katsanisa na ku avelana hi nkarhi wa ku tlanga ka vona, naswona vuyelela swikumiwa swa vona na vona, xik. 'U hlayele u humesa ntlhanu wa vuhlalu byo tshwuka kutani endzhaku u hlayele u humesa ntlhanu wa vuhlalu bya wasi. A hi hlayeleni leswaku mi na vuhlalu byingani. Sweswi hi swona khume ra vuhlalu.'
- Pfuna vana ku ehleketa hi mayelana na mifungho hi nkarhi wa ntlangu wa norho. Ringanyeta hilaha xilo xin'we xi nga ha yimelaka xin'wana, xik. 'U nga hundzuluxa tafula rero ri komba milenge ehenhla kutani u ri tirhisa tanihi byatsu bya wena.'

4. Nawu wa levhele

Nhlamuselo

Swikili na minongoti swi aka ehenhla ka xin'wana. Leswi swi vitaniwa **matirhelo ya nhluvukiso lama yaka emhlweni**. Vadyondzi va aka vutivi hi leswi se va swi tivaka naswona va se va kotaka ku swi endla. Madyondziselo ya kahle ya lawuriwa hi mudyondzi loko a rhanga a kumisisa leswi vadyondzi se va swi tivaka na ku swi twisisa, kutani a tirhisa migingiriko na swiyimo swa masiku hinkwawo ku aka ehenhla yona ku va pfuna ku dyondza vutivi na swikili swintshwa.

DLILOSARI

matirhelo ya nhluvukiso lama yaka emhlweni
malongolokelo lama swikili na minongoti swi akaka hawona ehenhla ka xin'wana

Each learner in your class will have had different experiences. This means that they are all at different starting points in Grade R. Each learner's prior knowledge is the starting point for what he or she will learn. Learners can use what they know already to learn new maths concepts and skills.

In practice ...

- Plan games and activities that are appropriate for observing learners' prior knowledge.
- Observe what learners do and say when they play, and how they manage different activities.
- Record individual learners' strengths and needs.
- Plan new activities that build on each learner's prior knowledge and current understanding.

More about the level principle

Differentiation

Learners in a Grade R classroom are all a similar age, but they each have individual personalities, needs, abilities, strengths and challenges. They differ in:

- their home experience
- their cultural background
- their socio-economic background
- their language level
- their interests
- their prior knowledge
- their readiness to learn
- the pace at which they need to learn
- the support they need from teachers and others to learn.

Teachers need to continuously observe and record each learner's progress and development in maths. Differentiation means that what you teach and the way in which you teach it needs to take into account the different abilities or developmental levels of your learners.

To use this approach, teachers need to observe each learner during activities and determine what they understand and are able to do successfully, and then use this information to plan activities and support for the learners. Some learners may understand a new idea that is presented in an activity, with just a little support from the teacher. Other learners might need more time, more demonstrations, more examples and more support from the teacher to achieve the same level of understanding.

Consider the example of learners in a Grade R class who are all learning about the same topic – position in space (on/under, in front of/behind).

- Some learners will understand the difference between these positions with a little time and explanation from the teacher. They will soon be ready to move on to the next concept – positions in space found in pictures.

Mudyondzi un'wana na un'wana etlilasini ya wena u na mitokoto yo hambanahambana. Leswi swi vula leswaku hinkwavo va le ka tindhawu to sungula to hambanahambana eka Giredi ya V. Vutivi bya khale bya mudyondzi un'wana na un'wana i ndhawu ya masungulo ya leswi a nga ta swi dyondza. Vadyondzi va nga tirhisa leswi se va swi tivaka ku dyondza minongoti na swikili swintshwa swa matematiki.

Eka maendlelo ...

- Kunguhata mitlangu na migingiriko leyi yi faneleke eka ku xiya vutivi bya khale bya vadyondzi.
- Xiya leswi vadyondzi va swi endlaka na ku swi vula loko va tlanga, na hilaha va kotaka hakona ku lawula migingiriko yo hambanahambana.
- Rhekoda matimba na swilaveko swa vadyondzi hi un'weun'we.
- Kunguhata migingiriko yintshwa leyi akaka ehenhla ka vutivi bya khale bya mudyondzi un'wana na un'wana na ntwisiso wa nkarhi wa sweswi.

Swo tala hi mayelana na nawu wa levhele

Vuhambanisi

Vadyondzi lava nga ekamareni ro dyondzela ra Giredi ya V hinkwavo va na malembe yo ringana hi vukhale, kambe un'wana na un'wana u na vumunhu bya yena n'wini, swilaveko, vuswikoti, matimba na mitlhontlho. Va hambana hi:

- hi ntokoto wa vona wa le kaya
- mfuwo lowu wu va rhendzeleke
- vanhu na ikhonomi leswi swi va rhendzeleke
- levhele ya vona ya ririmi
- mitsakelo ya vona
- vutivi bya vona bya khale
- vululameri bya vona bya ku dyondza
- rivilo leri va tsakelaka ku dyondza harona
- nseketelo lowu va wu lavaka kusuka eka vadyondzisi na van'wana ku dyondza.

Vadyondzisi va fanele ku ya emahlweni va xiyaxiya na ku rhekoda matirhelo lama yaka emahlweni ya mudyondzi un'wana na un'wana na nhluvuko eka matematiki. Vuhambanisi swi vula leswaku leswi u swi dyondzisaka na ndlela leyi u dyondzisaka hayona swi lava u tekela enhlokweni vuswikoti byo hambanahambana kumbe tilevhele ta nhluvukiso ta vadyondzi va wena.

Ku tirhisa endlelo leri, vadyondzisi va fanele ku xiya mudyondzi un'wana na un'wana hi nkarhi wa migingiriko na ku tiyisisa leswi va swi twisisaka na leswi va kotaka ku swi endlela hi ndlela leyi humelelaka, kutani endzhaku va tirhisa vuxokoxoko lebyi ku kunguhata migingiriko na ku seketela vadyondzi. Vadyondzi van'wana va ga ha twisisa mianakanyo wuntshwa lowu endliiwaka eka nghingiriko, hi nseketelo lowutsongo kusuka eka mudyondzisi. Vadyondzi van'wana vona va nga ha lava nkarhi wo tala, mikombiso yo tala, swikombiso swo tala na nseketelo wo tala kusuka eka mudyondzisi ku fikelela levhele yo fana ya ntwisiso.

Tekela enhlokweni xikombiso xa vadyondzi lava nga eka tlilasi ya Giredi ya V lava hinkwavo va dyondzaka hi mayelana na nhlokomhaka yo fana – xiyimo endhawini (ehenhla ka/ehansi ka, emahlweni ka/endzhaku ka).

- Vadyondzi van'wana va ta twisisa ku hambana exikarhi ka swiyimo leswi hi nkarhi lowutsongo na hi nhlamuselo yitsomgo kusuka eka mudyondzisi. Hi xinkadyana va ta va lunghekile ku hundzela emahlweni ku ya eka nongoti lowu landzelaka – swiyimo endhawini leswi kumekaka eswifanisweni.

- Other learners may need more time and explanation from the teacher while working on activities. They will also move on to the next concept, but it will take them longer and they will need more support.

In practice ...

You can use differentiation in your teaching by:

- being aware of similarities and differences amongst your learners
- planning the best way to teach each learner based on their strengths
- changing what is taught so that it takes into account the ability, **sensory perceptual skills**, prior knowledge, interests and cultural background of all learners
- adjusting, where necessary, what you expect each learner to have learnt by the end of the activity
- thinking about learners' personalities as well as their abilities when you decide how to group learners so that they can learn from and support each other in their groups
- using appropriate activities and resources
- teaching different learners at different rates, e.g. some learners may require more time to complete activities or answer questions than other learners
- using small group activities so that you can focus on individual learners and provide appropriate support for them if they need it
- planning activities for those learners who need more challenging tasks.

GLOSSARY

sensory perceptual skills
using your senses to gather information about your environment, for example: seeing, hearing, touching, smelling and tasting

5. The interaction principle

Definition

Learning involves communication and the sharing of ideas. Learners should be encouraged to talk with the teacher and with each other about what they are thinking and doing. Sharing ideas, asking questions and explaining what they are doing helps them to develop their understanding of concepts. It also helps them learn to use maths language with confidence.

In practice ...

- The classroom atmosphere needs to be relaxed so that learners feel free to ask questions and to share their ideas with each other while they are busy solving problems.
- Young learners need to be taught to use maths words correctly so that they can use them to express their ideas and thinking, e.g. learning to describe a ball as 'round' rather saying it is 'a circle'.

- Vadyondzi van'wana va nga ha lava nkarhi wo tala na nhlamuselo kusuka eka mudyondzisi loko va ri karhi va tirha hi migingiriko. Va ta tlhela va hundzela emahlweni eka nongoti lowu landzelaka kambe swi ta va tekela nkarhi wo leha naswona va ta lava nseketelo wo tala.

Eka maendlelo ...

U nga tirhisa vuhambanisi eka madyondziselo ya wena hi ku:

- tiva ku fana na ku hambana exikarhi ka vadyondzi va wena
- kunguhata ndlela ya kahle swinene ya ku dyondzisa mudyondzi un'wana na un'wana leyi simekiweke ehenhla ka matimba ya yena
- cinca leswi dyondzisiwaka ku endlela leswaku swi tekela enhlokweni vuswikoti bya vona, **swikili swa ku vona swo twiwa**, vutivi bya nkarhi lowu nga hundza, mitsakelo na mfuwo lowu rhendzeleke vadyondzi hinkwavo
- fambelanisa, laha swi lavekaka, leswi u langutelaka mudyondzi un'wana na un'wana ku va a swi dyondzile emakumu ka nghingiriko
- ehleketa hi mayelana na vumunhu bya vadyondzi xikan'we na vuswikoti bya vona loko u boha hilaha u nga ntlawahata hakona vadyondzi ku endlela leswaku va dyondza kusuka eka un'wana na un'wana na ku seketelana emitlaweni ya vona
- tirhisa migingiriko na swipfuno leswi faneleke
- dyondzisa vadyondzi vo hambanahambana hi mipimo yo hambanahambana, xik. vadyondzi van'wana va nga ha lava nkarhi wo tala ku hetisa migingiriko kumbe ku hlamula swin'wana kutlula vadyondzi van'wana
- tirhisa migingiriko ya ntlawa lowutsongo ku endlela leswaku u kongomisa eka vadyondzi hi un'weun'we na ku va nyika nseketelo lowu faneleke loko va wu dinga
- kunguhata migingiriko ya vadyondzi lavaya va lavaka mitirho yo tlhontlha swinene.

DLILOSARI

swikili swa ku vona swo twiwa ku tirhisa switwi swa wena ku hlengeleta vuxokoxoko hi mayelana na mbangu wa wena, tanihi xikombiso: ku vona, ku twa, ku khumba, ku nuheta na ku ringeta

5. Nawu wa n'wangulano

Nhlamuselo

Ku dyondza swi katsa mbulavurisano na ku avelana ka miehleketo. Vadyondzi va fanele ku khutaziwa ku vulavula na mudyondzisi na hi xivona hi mayelana na leswi va swi ehleketaka na ku swi endla. Ku avelana mianakanyo, ku vutisa swivutiso na ku hlamusela leswi va swi endlaka swi va pfuna ku hluvukisa ntwisiso wa vona wa minongoti. Swi tlhela swi va pfuna ku tirhisa ririmi ra matematiki hi vutitshembi.

Eka maendlelo ...

- Moya wa le kamareni ro dyondzela wu fanele wu debyisiwa ku endlela leswaku vadyondzi va titwa va tshunxekile ku vutisa swivutiso na ku avelana mianakanyo ya vona na van'wana loko va ri eku ololoxeni a swiphiqo.
- Vadyondzi lavatsongo va fanele ku dyondzisiwa ku tirhisa marito ya matematiki hindlela leyi nga lulama ku endlela leswaku va kota ku ma tirhisa ku paluxa mianakanyo na miehleketo ya vona, xik. ku dyondza ku hlamusela bolo tanihi 'xirhendzevutana' ematshwan'weni ya ku vula leswaku i 'sekele'.

Learners tend to say, '*too small*'. Reinforce the maths language by repeating what the learner has said, but use '*too short*' instead.

Figure 15 Teachers can guide children to use maths language.

More about the interaction principle

Communication: Active listening and speaking

We learn best when we do something and talk with another person, in pairs or groups. Learners need to develop skills in communicating and need to know how to be part of a conversation. They should learn to listen actively to what the other person is saying, and respond appropriately. This means that they need to be able to:

- listen to what is being said
- respond in a way that is appropriate
- take turns in speaking and listening.

In practice ...

Help learners to develop good listening and speaking skills by providing opportunities for them to:

- join in a conversation or discussion
- listen carefully in a focused way
- share or express their thoughts and ideas
- give responses and feedback
- ask questions
- follow instructions.

When teachers listen to learners actively, learners:

- are encouraged to share their ideas, questions, problems and opinions
- feel that the teacher is interested in them and cares about whether they understand something
- develop their own active listening skills.

Responding in an appropriate way to something is an important part of communication, and of teaching and learning. When learners get a proper response to their questions or ideas, they believe that their ideas are important and have value. It also models for them how to respond appropriately.

Vadyondzi va tala ku vula, '*ntsongo kutlula mpimo*'. Tiyisa ririmi ra matematiki hi ku vuyelela leswi mudyondzi a swi vuleke, kambe tirhisa '*yi komile kutlula mpimo*' ematshan'weni.

Xifaniso xa 15 Vadyondzisi va nga letela vana ku tirhisa ririmi ra matematiki.

Swo tala hi mayelana na nawu wa n'wangulano

Vuhlanganisi: Ku yingisela na ku vulavula loku gingirikaka

Hi dyondza kahle swinene loko hi endla swin'wana na ku vulavula na munhu un'wana, hi vambirhimbirhi kumbe hi mitlawa. Vadyondzi va fanele ku hluvukisa swikili swa ku angulana naswona va fanele ku tiva hilaha va nga vaka hakona xiphemu xa mbulavurisano. Va fanele ku dyondza ku yingisa va xalamukile eka leswi munhu un'wana a swi vulaka, na ku angula hi ndlela leyi faneleke. Leswi swi vula leswaku va fanele ku kota ku:

- yingisela leswi swi nga eku vuriweni
- angula hi ndlela leyi yi faneleke
- cincana eka ku vulavula na ku yingisela.

Eka maendlelo ...

Pfuna vadyondzi ku hluvukisa swikili swa ku yingisela na ku vulavula kahle hi ku va nyika nkarhi wa vona ku:

- tikatsa eka mbulavurisano kumbe nkanelo
- yingisela hi vukheta hi ndlela leyi kongomisaka
- avelana kumbe ku paluxa miehleketo na mianakanyo
- nyika miangulo na xivikontsundzuxo
- vutisa swivutiso
- landzelela swileriso.

Loko vadyondzisi va yingisela vadyondzi hi ku gingiriki, vadyondzi:

- va khutaziwa ku avelana mianakanyo, swivutiso, swiphiqo na mavonelo ya vona
- va titwa leswaku mudyondzisi u na ku tsakela eka vona naswona u na mhaka na loko va twisisa swin'wana
- hluvukisa swikili swa vona vini swo yingisela va xalamukile.

Ku angula hi ndlela leyi faneleke eka swin'wana i xiphemu xa nkoka xa mbulavurisano, na xa madyondziselo na madyondzelo. Loko vadyondzi va kuma angulo lowu nga fanela eka swivutiso na mianakanyo ya vona, va kholwa leswaku mianakanyo ya vona i ya nkoka naswona yi na risima. Swi tlhela swi va aka hilaha va nga angulaka hakona hi ndlela leyi faneleke.

In practice ...

You can respond appropriately to your learners by:

- never allowing them to feel they have asked a stupid question
- sometimes repeating a question they ask, so that they know they are being listened to
- encouraging them to ask clear questions by rephrasing one of their questions, or asking them to repeat it in a different way
- trying to answer their questions in ways that are meaningful to them, e.g. by drawing on what they already know, and/or by using examples from their experience.

The role of language in maths

We all use language to communicate. We use it to share ideas and information, and to describe **abstract** ideas. Language is also important for maths. We need it to describe, understand, question, think, reason, explain and represent maths concepts.

GLOSSARY

abstract
an idea, a thought or a feeling

exact
precise, accurate

The language of maths includes the words and symbols we use to communicate or share maths ideas or concepts. Sometimes we use everyday language, but maths language is **exact** and specific. You can read more about everyday knowledge and school knowledge on pages 16–23. Here are three examples of this.

- In everyday language the word 'half' might be used to describe something that is more or less shared into two parts of a similar size. However, in maths, 'half' means two parts of a whole that has been divided equally. The two parts are exactly the same size or number.
- In everyday language we might say, 'The teacher is big.' However, in maths we would say, 'The teacher is tall', and measure his/her height, counting 'one', 'two', 'three', and so on as we measure.
- In everyday language we might say that the triangle is a pointy shape. However, in maths we would say that a triangle has three straight sides and three corners.

Figure 16 Maths language is exact.

Eka maendlelo ...

U nga angula vadyondzi va wena hi ndlela leyi faneleke hi ku:

- nga pfuki u va pfumelerile ku titwa ingaku va vutisile xivutiso xa vuphunta
- mikarhi yin'wana u vuyelela xivutiso lexi va xi vutisaka, ku endlela leswaku va swi tiva leswaku va le ku yingiseriweni
- va khutaza ku vutisa swivutiso leswi nga erivaleni hi ku vumba hi vuntshwa xin'wana xa swivutiso swa vona, kumbe ku va kombela ku xi vuyelela hi ndlela yo hambana
- ringeta ku hlamula swivutiso swa vona hi tindlela leti nga ta nkoka eka vona, xik. hi ku teka eka leswi se va swi tivaka, na/kumbe hi ku tirhisa swikombiso kusuka eka mitokoto ya vona.

Xiave xa ririmi eka matematiki

Hinkwerhu hi tirhisa ririmi ku vulavurisana. Hi ri tirhisa ku avelana mianakanyo na vuxokoxoko, na ku hlamusela matitwele yo **anakanyiwa**. Ririmi ri tlhela ri va ra nkoka eka matematiki. Ha ri lava ku hlamusela, ku twisisa, ku vutisa, ku ehleketa, ku ehleketisisa, ku hlamusela na ku ri tirhisa ku yimela minongoti ya matematiki.

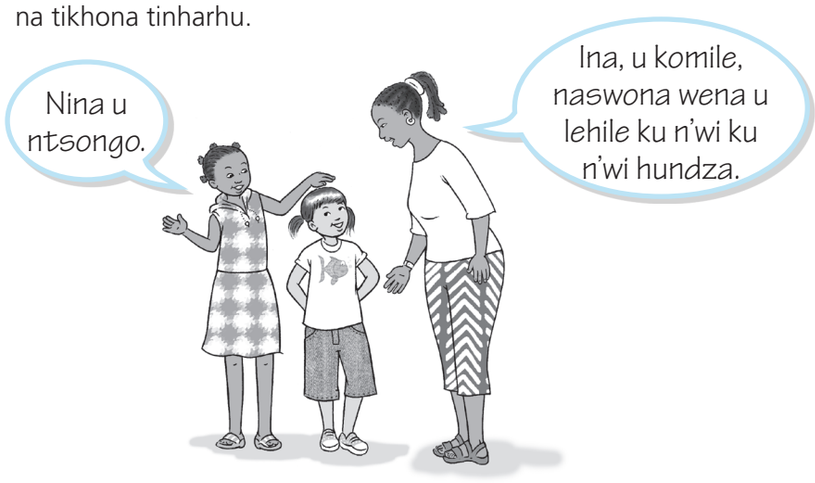
DLILOSARI

xianakanyiwa
mianakanyo, miehleketo kumbe matitwelo

kwatsa
kongomaka, nkhaqato

Ririmi ra matematiki ri katsa marito na mifungho leyi hi yi tirhisaka ku vulavula kumbe ku avelana mianakanyo kumbe minongoti ya matematiki. Mikarhi yin'wana hi tirhisa ririmi ra masiku hinkwawo, kambe ririmi ra matematiki ro **kwatsa** na ku kongoma. U nga hlayisa swo tala hi mayelana na vutivi bya masiku hinkwawo na vutivi bya le xikolweni eka tipheji ta 16–23. Hi leswi swikombiso swinharhu swa leswi.

- Eka ririmi ra masiku hinkwawo rito 'hafu' ri nga ha tirhisiwa ku hlamusela swin'wana leswi talaka ku va swi avelaniweke hi swiphemu swimbirhi swa sayizi yo fana. Hambiswiritano, eka matematiki, 'hafu' swi vula swiphemu swimbirhi swa xa xin'we leswi swi avanyisiweke hi ku ringana. Swiphemu leswiswimbirhi swi na sayizi kumbe nhlayo yo fana kwatsa.
- Hi ririmi ra masiku hinkwawo hi nga vula, 'Mudyondzisi u nkulu.' Hambiswiritano, eka matematiki hi ta vula hi ku 'Mudyondzisi u lehile', kutani hi pima vulehelahenhla ('vulehi') bya yena, hi hlayela 'n'we', 'mbirhi', 'nharhu', sweswosweswo loko hi ri karhi hi pima.
- Hi ririmi ra masiku hinkwawo hi nga vula leswaku yinhlanharhu i xivumbeko xa makumu yo tontswa. Hambiswiritano, eka matematiki hi ta vula leswaku yinhlanharhu yi na matlhelo manharhu mo thwixama na tikhona tinharhu.



Xifaniso xa 16 Ririmi ra matematiki ro kwatsa.

Developing children's maths language

Part of learning new concepts involves learning new language. Teachers need to guide learners as they gradually begin to understand and use new maths language at school and in their daily lives. They need to introduce Grade R learners to the correct maths vocabulary that will allow them to follow instructions, ask questions and express their thinking and reasoning. Learners acquire new language and maths at the same time. As they learn new words, they learn more concepts, then they learn more words and more concepts, and so they become more and more successful in their maths tasks.

In practice ...

Learners who know the meaning of the words 'round' and 'flat' can describe the mathematical properties of objects. For example, through their play they come to realise that round objects roll and objects with flat sides slide. Learners who do not know the terms 'round' or 'flat' can only draw limited conclusions about the objects they explore – boxes slide and balls roll. These learners need to be encouraged to learn the appropriate new language to extend their conceptual understanding and knowledge.

Figure 17 Developing maths language through play

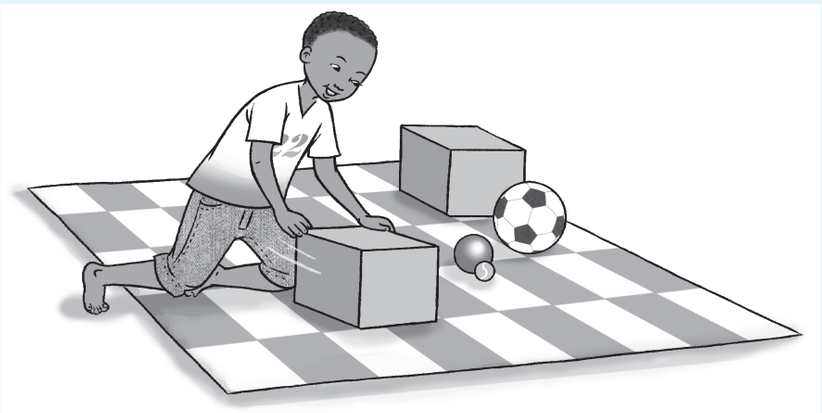
Encourage learners to use their home language as much as possible. This helps to develop their general language abilities and thinking skills. In South Africa, many Grade R learners learn through their second or third language. Maths teaching can help to develop their ability to use these languages if they are given opportunities to talk about what they are doing during maths activities, to share their ideas and to discuss their reasoning.

Ku hluvukisa ririmi ra vana ra matematiki

Xiphemu xa ku dyondza minongoti yintshwa xi katsa ku dyondza ririmi rintshwa. Vadyondzisi va fanele ku letela vadyondzi loko va ri karhi va sungula hi katsongotsongo ku twisisa na ku tirhisa ririmi ra matematiki rintshwa exikolweni na le vuton'wini bya vona bya siku na siku. Va fanele ku sungurisa vadyondzi va Giredi ya V eka ntivoririmi wa matematiki lowu nga lulama lowu wu nga ta va pfumelela ku landzelela swileriso, ku vutisa swivutiso na ku paluxa mavonelo na miehleketo. Vadyondzi va kuma ririmi rintshwa na matematiki hi nkarhi wun'we. Loko va ri karhi va dyondza marito mantshwa va dyondza minongoti yo tala, kutani va dyondza marito mo tala na minongoti yo tala, kutani hi ndlela yaleyo va humelela swinene eka mitirho ya vona ya matematiki.

Eka maendlelo ...

Vadyondzi lava va tivaka nhlamuselo ya marito 'xirhendzevutana' na 'patlama' va nga kota ku hlamusela swihlawulekisi swa matematiki swa michumu. Tanihi xikombiso, hi ku tirhisa ntlangu wa vona va lemuka leswaku michumu ya xirhendzevutana ya khunguluka kasi michumu yo patlama ya rheta. Vadyondzi lava nga tiviki matheme ya 'xirhendzevutana' kumbe 'patlama' va nga ta ntsena na mahetelelo lama tsongahaleke hi mayelana na michumu leyi va yi valangaka – mabokisi ya rheta naswona tibolo ta khunguluka. Vadyondzi lava va fanele ku khutaziwa ku dyondza ririmi lerintshwa leri nga fanela ku ndlandlamukisa ntwisiso vutivi bya vona bya minongoti.



Xifaniso xa 17 Ku ndlandlamuxa ririmi ra matematiki hi ku tirhisa ku tlanga

Khutaza vadyondzi ku tirhisa ririmi ra vona ra le kaya swinene hilaha va kotaka hakona. Leswi swi pfuna ku hluvukisa vuswikoti bya vona bya ririmi ro angarhela na swikili swa ku ehleketa. EAfrika-Dzonga, vadyondzi va ka Giredi ya V vo tala va dyondza hi ku tirhisa ririmi ra vona ra vumbirhi kumbe ra vunharhu. Ku dyondzisa matematiki swi nga pfuna ku hluvukisa vuswikoti bya vona bya ku vona bya ku tirhisa tindzimi leti loko va nyikiwa swivandlanene swa ku vulavula hi mayelana na leswi va nga eku swi endleni hi nkarhi wa migingiriko ya matematiki, ku avelana mianakanyo ya vona na ku kanela maehleketelo ya vona.

Learning correct maths vocabulary
Learners need the vocabulary to talk and think about maths concepts. For example, they need to know words such as these to describe:

Figure 18

- quantity (a lot, more, many, fewer)

Figure 19

- calculation (add, take away)

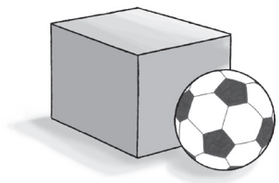


Figure 20

- shape (round, square)

Figure 21

- position (first, second, third, last, before, after, between)

Figure 22

- size (big, small)

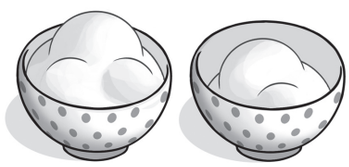


Figure 23

- measurement (more, less, long, wide, full, heavy, tall, short, morning, night)

Encourage learners to use maths vocabulary by using it yourself when you speak with them about maths concepts, and by rephrasing what they say into maths language. At the end of each Content Area in Section 3 there is a full list of maths vocabulary specific to the Content Area.

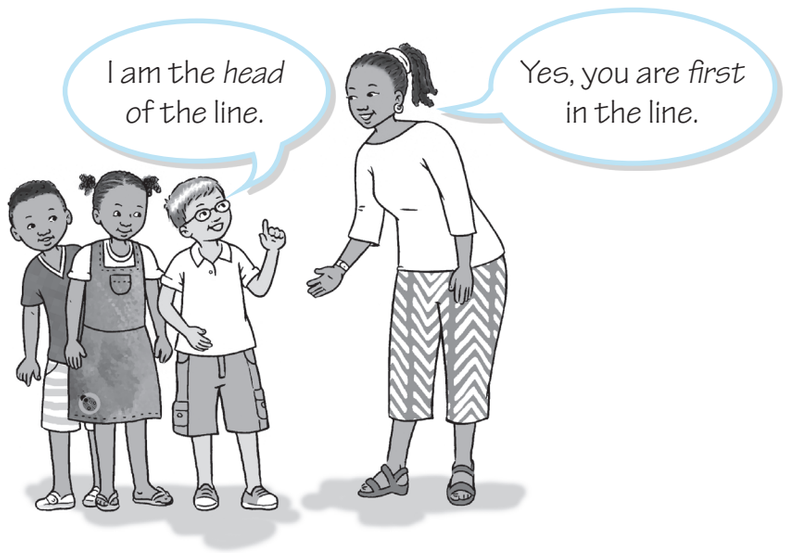


Figure 24 Encourage learners to use maths vocabulary.

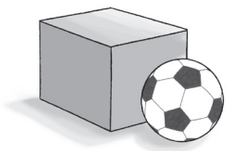
Ku dyondza ntivoririmi wa matematiki lowu nga lulama
Vadyondzi va dinga ntivoririmi ku vulavula na ku ehleketa hi mayelana na minongoti ya matematiki. Tanihi xikombiso, va fanele ku tiva marito yo tanihi lama ku hlamusela:

Xifaniso xa 18

- ntalo (swo tala swinene, kutlula, swo tala, ntsongo ngopfu)

Xifaniso xa 19

- makhakuletelo (hlanganisa, susa)



Xifaniso xa 20

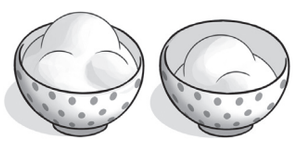
- xivumbeko (xirhendzevutana, xikwere)

Xifaniso xa 21

- xiyimo (vun'we, vumbirhi, vunharhu, hetelela, ku nga si va na, endzhaku ka, exikarhi ka)

Xifaniso xa 22

- sayizi (nkulu, ntsongo)



Xifaniso xa 23

- mpimo (tala swinene, ntsongo, leha, anama, tala, tika, leha, koma, mixo, vusiku)

Khutaza vadyondzi ku tirhisa ntivoririmi wa matematiki hi ku va wena u wu tirhisa loko u vulavula na vona hi mayelana na minongoti ya matematiki, na hi ku vumba hi vuntshwa swivulwa swa leswi va swi vulaka hi ririmi ra matematiki. Emakumu yan'wana na yan'wana ya Xiyenge xa Vundzeni eka Xiyenge xa 3 ku na nongonoko wa vutalo wa ntivoririmi wa matematiki loku nga kongomana na Xiyenge xa Vundzeni.

Xifaniso xa 24. Khutaza vadyondzi ku tirhisa ntivoririmi wa matematiki.

Maths focuses on the relationship between things. Learners need the language to think and talk about these relationships, including:

- comparisons between collections (many, few, more, fewer)
- comparison of size and measurement (big/small, taller/shorter, heaviest/lightest)
- comparison of shape (three sides, four sides, round or curved)
- position in space (in front of, behind, under, next to, between)
- the order of things (first, last, second, next, before, after, between)
- comparisons between the amount of something (more, less, the same).

Understanding and using symbols

Symbols are all around us. The signs that learners see in their everyday environment often have both words and symbols on them. Learners learn that these words and symbols have meaning. For example, symbols show you when to cross the road or how much something costs.

Figure 25 A stop sign and the numeral '2' are both symbols.

Young children experiment with written symbols through their drawing and early writing attempts. In Grade R, understanding maths language builds the foundation for using maths symbols correctly.

Reasoning and predicting

Learners also need the language to:

- follow and comment on someone else's **reasoning**
- explain their own thinking and use this to **predict** what will happen next. They need language to describe a pattern and to say what will come next if the pattern is continued.

GLOSSARY

reasoning
the thinking behind an idea or statement

predict
to say or estimate what will happen in the future

Figure 26 Predicting what shape comes next in the sequence.

In practice ...

To encourage maths language development, learners need plenty of opportunities to:

- play
- spend time with and communicate with adults and other children
- talk about their ideas and reasoning.

Matematiki wu kongomisa eka vuxaka exikarhi ka swilo. Vadyondzi va dinga ririmi ku ehleketa na ku vulavula hi mayelana na vuxaka lebyi, ku katsa na:

- mifananiso exikarhi ka mihlengelo ya michumu (tala, ntsongo, tala swinene, tsongo ngopfu)
- mfananiso wa sayizi na mpimo (nkulu/ntsongo, leha/koma, tika swinene/vevuka swinene)
- mfananiso wa xivumbeko (matlhelo manharhu, matlhelo ma mune, ya xirhendzevutana kumbe yo goveka)
- xiyimo eka ndhawu (emahlweni ka, endzhaku ka, ehansi ka, ekusuhi na, exikarhi ka)
- malongolokelo ya swilo (vun'we, hetelela, vumbirhi, landzelaka, emahlweni, endzhaku ka, exikarhi ka)
- mfananiso exikarhi ka mpimo wa xin'wana (tala, ntsongo, fana).

2

Xifaniso xa 25 Mfungho wa yima na nhlanga '2' hamimbirhi i mifungho.

Ku twisisa na ku tirhisa mifungho

Mifungho yi hinkwakonkwako laha hi nga kona. Mifungho leyi vadyondzi va yi vona eka mbangu wa vona wa masiku hinkwawo kotala yi na havumbirhi bya marito na mifungho eka yona. Vadyondzi va dyondza leswaku marito lama na mifungho leyi swi na nhlamuselo. Tanihi xikombiso, mifungho yi ku komba leswaku i nkarhi wihi u faneleke ku tsemakanya gondzo kumbe leswaku xokarhi xi durha mali muni.

Vana lavatsongo va kambisisa hi mifungho yo tsariwa hi ku dirowa ka vona na le ka miringeto ya ku tsala ya le masungulweni. Eka Giredi ya V, ku twisisa ririmi ra matematiki swi aka masungulo eka ku tirhisa mifungho ya matematiki hi ndlela leyi nga lulama.

DLILOSARI

miehleketo ya xivangelo
miehleketo leyi vangaka mianakanyo kumbe xitatimente

vhumba
ku vula kumbe ku kumbetela leswi swi nga ta humelela eka nkarhi lowu taka

Ku ehleketa na ku vhumba

Vadyondzi va tlhela va lava ririmi ku:

- landzelela na ku nyika mavonelo hi **miehleketo ya xivangelo** ya munhu un'wana
- hlamusela miehleketo ya vona na ku tirhisa yona ku **vhumba** leswi nga ta humelela ku landzela swoleswo. Va lava ririmi ku hlamusela patironi na ku vula leswi swi nga ta landzela loko patironi leyi yi yisiwa emahlweni.

Xifaniso xa 26 Ku vumba leswaku i xivumbeko muni xi landzelaka eka malongolokelo.

Eka maendlelo ...

Ku khutaza nhluvukiso wa ririmi ra matematiki, vadyondzi va lava swivandlanene swo tala ku:

- tlanga
- va na nkarhi na vatswatsi na vana van'wana na ku vulavurisana na vona
- ku vulavula hi mayelana na mianakanyo na xivangelo.

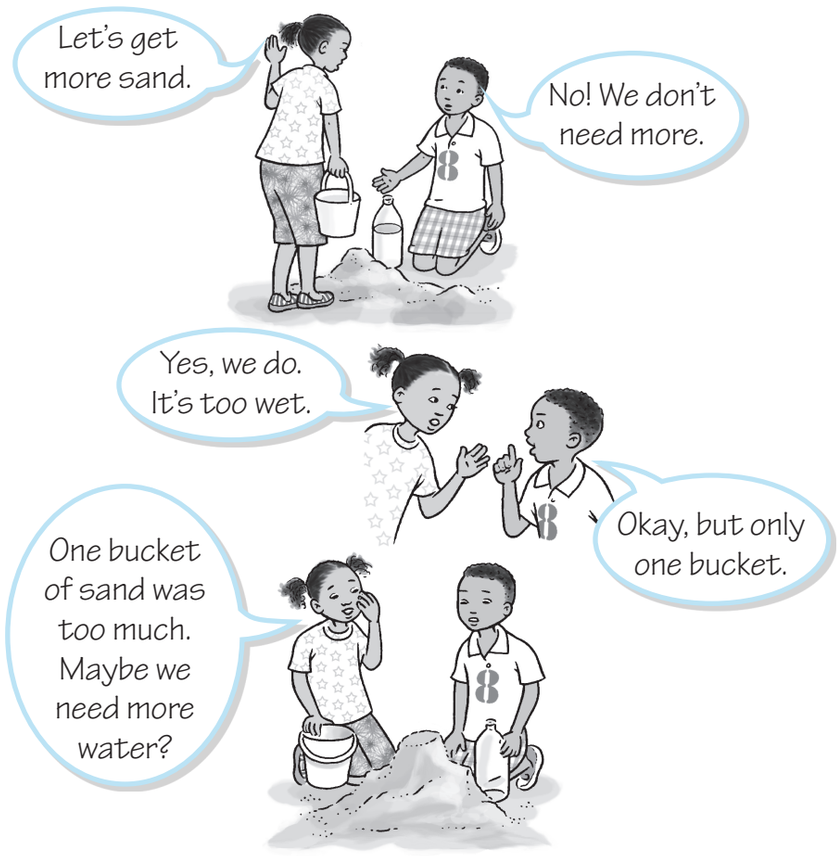


Figure 27 Play is an opportunity to use maths language.

Notice how learners use maths language when they:

- talk about what they are doing
- describe their experiences outside of school, e.g. setting the dinner table, playing a game or explaining how they got from home to school
- make up words when the don't yet know the correct maths language for something, e.g. describing a corner as a 'sharp end' or naming 'eleven' as 'eleventeen'
- predict what will happen, e.g. 'The tower will fall over if I put more blocks on the top.'

6. The guidance principle

Definition

Teachers guide learners in understanding new knowledge. They organise the teaching and learning situation to create opportunities for learners to focus on specific tasks and materials so that the learners can explore an idea and share their thinking about a maths problem. Teachers model what to do and ask guiding questions to help learners solve the problem. This is sometimes called **mediation**. Through mediation, learners develop new knowledge, behaviours and strategies for solving problems that they can use in other contexts.

GLOSSARY

mediation
a joint activity where a person who knows more or has more highly developed skills guides others to learn something new

Xifaniso xa 27 Ntlangu i xivandlanene xa ku tirhisisa ririmi ra matematiki.

Vona hilaha vadyondzi va tirhisaka hakona ririmi ra matematiki ku:

- vulavula hi mayelana na leswi va swi endlaka
- hlamusela mitokoto ya vona ya le handle ka xikolo, xik. ku andlalela tafula ra dina, ku tlanga ntlangu kumbe ku hlamusela hilaha va fikeke exikolweni hakona kusuka ekaya
- tivumbela marito loko va nga se tiva ririmi ra matematiki leri nga lulama ra swin'wana, xik. ku hlamusela khona tanihi 'makumu yo tontswa' kumbe ku vula vito ra 'khumen'we' tanihi 'khumen'wen'we'
- vhumba leswi nga ta humelela, xik. 'Xihondzo xi ta wa loko u vekela tibuloko to tala ehenhla.'

6. Nawu wa ndzetelo

Nhlamuselo

Vadyondzisi va letela vadyondzi eka ku twisisa vutivi lebyintshwa. Va lulamisa xiyimo xa ku dyondzisa na ku dyondza ku tumbuluxa swivandlanene swa vadyondzi ku kongomisa eka mitirho yo kongoma na timatheriyali ku endlela leswaku vadyondzi va ta kota ku valanga mianakanyo na ku avelana maehleketelelo ya vona hi mayelana na xiphiqo xa matematiki. Vadyondzisi va letela leswi swi faneleke ku endliwa kutani va vutisa swivutiso swo letela ku pfuna vadyondzi ku ololoxa xiphiqo. Leswi mikarhi yin'wana swi vitaniwa **vuhlanganisi**. Hi ku tirhisa vuhlanganisi, vadyondzi va kuma vutivi byintshwa, mahanyelo mantshwa na maqhinga mantshwa mo ololoxa swiphiqo lama va nga kotaka ku ma tirhisa eka mivangu yin'wana.

DLILOSARI

vuhlanganisi
nghingiriko wa nhlanganelo laha munhu loyi a tivaka swo tala kumbe a nga na swikili leswi hluvukisiweke hi ndlela ya le henhla swinene ku letela van'wana ku dyondza swin'wana swintshwa

In practice ...

How to use mediation in the classroom

1. Identify what concepts and skills the learners already know and plan an appropriate activity.
2. Give the learners an activity that focuses on the new concept or skill.
3. Model the activity or show the learners how to complete it.
4. Give feedback to the learners on what they are doing.
5. Give hints or clues to assist learners, but don't provide the solution.
6. Prompt the learners by asking questions about what they are doing.
7. Encourage learners to ask questions so that they make new connections and discoveries for themselves.
8. Give the learners another activity that they complete on their own, using the concept or skill they have learnt. In this activity, they should practise using the new skill or knowledge in different ways. Guide and support them, but in a less hands-on way.
9. Give the learners more activities and gradually withdraw your guidance and support, allowing them to do things on their own.

More about the guidance principle

Teaching approaches

Teaching involves using different approaches at different times:

- Direct instruction involves very little discussion. Learners might ask questions, but these are mostly to do with following the instructions. Direct instruction should be a very small part of teaching.
- Guided instruction involves teachers and learners working together to solve a problem or learn a new concept or skill. The teacher gives guidance and support until the learners are able to do the activity on their own. In Grade R Maths this is called a teacher-guided activity.

Structured activities

- Structured activities are teaching and learning activities, often guided by the teacher. They focus on a particular maths concept or skill.
- In the Grade R Maths programme, structured activities are divided into:
  - whole class activities
  - small group teacher-guided activities
  - small group independent activities
  - free choice activities.

Asking questions

Good questioning techniques are essential for teaching. Grade R Maths encourages teachers to use open-ended questions that stimulate maths thinking. These kinds of questions are found in problems and investigations. Open-ended questions also help teachers to gather information about learners' level of understanding and knowledge.

Eka maendlelo ...

Matirhiselo ya vuhlanganisi ekamareni ro dyondzela

1. Kuma leswaku i minongoti na swikili swihi leswi vadyondzi se va swi tivaka kutani u kunguhata nghingiriko lowu faneleke.
2. Nyika vadyondzi nghingiriko lowu wu kongomisaka eka nongoti kumbe xikili lexintshwa.
3. Letela nghingiriko kumbe ku komba vadyondzi hilaha va faneleke ku hetisa hakona.
4. Nyika vadyondzi xivikontsundzuxo hi leswi va nga eku swi endleni.
5. Nyika switsundzuxo kumbe vuthala ku pfuneta vadyondzi, kambe u nga nyiki xitshunxo.
6. Nyika vadyondzi vuthala byo khutaza hi ku vutisa swivutiso hi mayelana na leswi va nga eku swi endleni.
7. Khutaza vadyondzi ku vutisa swivutiso ku endlela leswaku va vumba mifambelaniso na vuthumbi byintshwa bya vona vini.
8. Nyika vadyondzi nghingiriko wun'wana leswaku va wu hetisa hi voxe, va ri karhi va tirhisa nongoti kumbe xikili lexi va xi dyondzeke. Eka nghingiriko lowu, va fanele ku titoloveta ku tirhisa xikili kumbe vutivi lebyintshwa hi tindlela to hambanahambana. Va letele na ku va seketela, kambe hi ndlela ya ku tinghenelerisa switsongo.
9. Nyika vadyondzi migingiriko yo tala kutani hi switsongotsongo u tlhentlhisa ndzetelo na nseketelo wa wena, u va pfumelela ku endla swilo hi voxe.

Swo tala hi mayelana na nawu wa ndzetelo

Maendlelo yo dyondzisa

Ku dyondzisa swi katsa ku tirhisa maendlelo yo hambanahambana hi mikarhi yo hambanahambana:

- Xileriso xo kongoma xi khumba nkanelo lowutsongo swinene. Vadyondzi va nga ha vutisa swivutiso, kambe leswi hakanyingi swi katsa ku landzelela swileriso. Xileriso xo kongoma xi fanele ku va xiphemu lexitsongo swinene xa ku dyondzisa.
- Xileriso lexi leteriwa xi katsa vadyondzisi na vadyondzi lava tirhisanaka ku ololoxa xiphiqo kumbe ku dyondza nongoti kumbe xikili xintshwa. Mudyondzisi u nyika ndzetelo na nseketelo kufikela loko vadyondzi va kota ku endla nghingiriko lowu hi voxe. Eka *Grade R Maths* leswi swi vitaniwa nghingiriko lowu leteriwaka hi mudyondzisi.

Migingiriko leyi kunguhatiweke

- Migingiriko leyi kunguhatiweke i migingiriko ya ku dyondzisa na ya ku dyondza, leyi hakanyingi yi leteriwaka hi mudyondzisi. Yi kongomisa eka nongoti wa kumbe xikili xa matematiki xo karhi.
- Eka nongonoko wa *Grade R Maths*, migingiriko leyi nga na xivumbeko yi avanyisiwile hi:
  - migingiriko ya tlilasi hinkwayo
  - migingiriko ya ntlawa lowutsongo leyi leteriwa hi mudyondzisi
  - migingiriko ya ntlawa lowutsongo leyi va tirhaka va ri voxe
  - migingiriko yo hlawula va tshunxekile.

Ku vutisa swivutiso

Tithekiniki ta mavutiselo ma kahle ta laveka swonghasi eka ku dyondzisa. *Grade R Maths* wu khutaza vadyondzisi ku tirhisa swivutiso leswi nga na makumu yo pfuleka leswi swi tlhontlhaka maehleketelelo ya matematiki. Mixaka leya swivutiso yi kumeka eka swiphiqo na vulavisisi. Swivutiso leswi nga na makumu yo pfuleka swi tlhela swi pfuna vadyondzisi ku hlengeleta vuxokoxoko hi mayelana na levhele ya vadyondzi ya ntwisiso na vutivi.

Closed questions (Low order questions)	Open-ended questions (Higher order questions)
Questions that have a limited or 'yes'/'no' response.	Questions that have more than one possible answer.
Example: Is this a triangle? Example: Is this a triangle or a square?	Example: What can you tell me about triangles? Example: How is a triangle different from a square?

In practice ...

- Ask open-ended questions that give learners opportunities to think independently and communicate their thinking. Avoid using closed questions that focus only on remembering facts, or that have only 'yes'/'no' answers.
- Give learners some time to try to answer a question so that they can think, organise their thoughts and then express them in words.

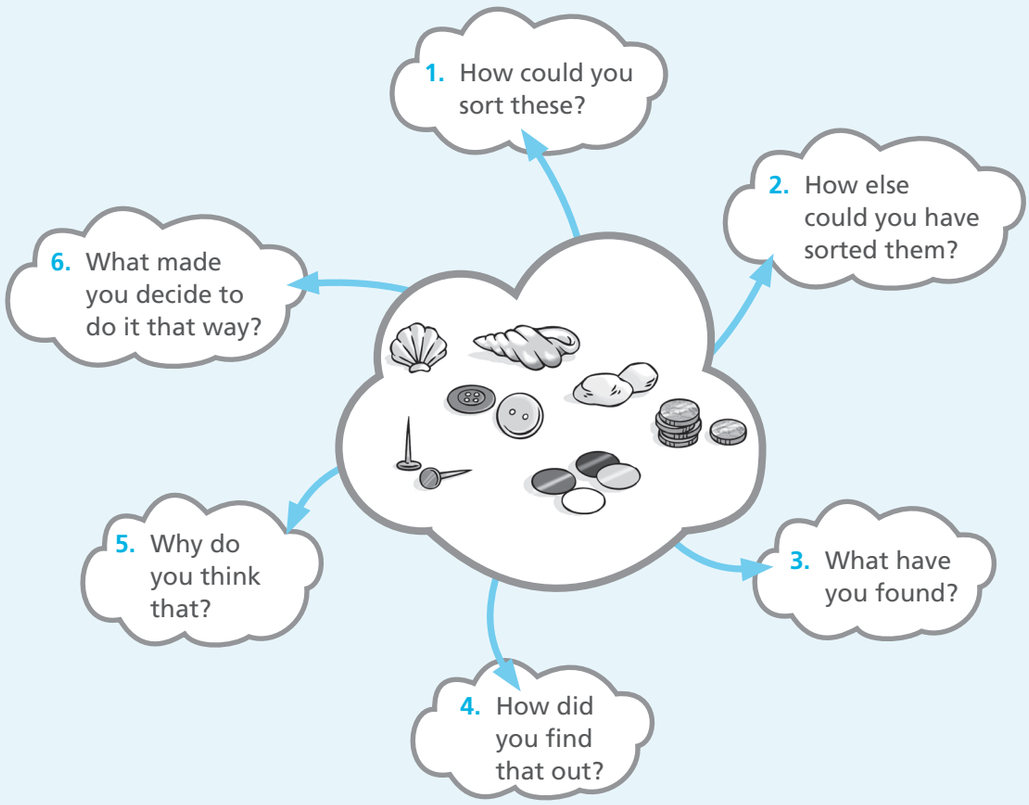


Figure 28 Open-ended questions

Problem solving

Learners encounter problems that they cannot solve immediately. Grade R teachers should support learners to develop skills to approach these problems more and more independently. This includes adequate time to talk about the problem, try out ideas, learn from mistakes, play with the problem and adapt their ideas based on investigations.

Swivutiso swo pfaleka (Swivutiso leswi laveka ku ehleketa ka le hansi)	Swivutiso leswi nga na makumu yo pfuleka (Swivutiso leswi lavaka ku ehleketa ka le henhla)
Swivutiso leswi swi nga na angulo lowu pimiweke kumbe wa 'ina'/'e-e'.	Swivutiso leswi ku nga kumekaka nhlamulo yo tlula yin'we.
Xikombiso: Xana lexi i yinhlanharhu? Xikombiso: Xana lexi i yinhlanharhu kumbe i xikwere?	Xikombiso: Xana hi swihi leswi u nga ndzi byelaka swona hi mayelana na tinhlanharhu? Xikombiso: Xana yinhlanharhu yi hambanile njhani na xikwere?

Eka maendlelo ...

- Vutisa swivutiso leswi nga na makumu yo pfuleka leswi swi nyikaka vadyondzi swivandlanene swa ku ehleketa va ri voxe na ku vulavurisana hi miehleketo ya vona. Papalata ku tirhisa swivutiso swo pfaleka leswi swi kongomisaka eka ku tsundzuka mitiyiso, kumbe leswi swi nga na tinhlamulo ta 'ina'/'e-e' ntsena.
- Nyika vadyondzi xinkadyana xa ku ringeta ku hlamula xivutiso ku endlela leswaku va ehleketa, va lulamisa miehleketo ya vona kutani endzhaku ka swona va yi paluxa hi marito.

Xifaniso xa 28 Swivutiso leswi nga na makumu yo pfuleka

Ku ololoxa swiphiqo

Vadyondzi va hlangana na swiphiqo leswi va nga kotiki ku swi ololoxa xikan'wekan'we. Vadyondzisi va Giredi ya V va fanele ku seketela vadyondzi ku hluvukisa swikili ku ahlula swiphiqo leswi va ri voxe hi katsongotsongo. Leswi swi katsa nkarhi wo engetela ku vulavula hi mayelana na xiphiqo lexi, ku ringeta mianakanyo, ku dyondza kusuka eka swihoxo, ku tlanga hi xiphiqo na ku cincanyana mianakanyo ya vona hi ku ya hi vulavisisi.

In practice ...

- Learners do most of the talking.
- Learners are encouraged to try out ideas and make mistakes.
- Learners share their thinking with the teacher and other learners.
- Teachers listen to learners' ideas.
- Teachers' questions are generally open ended and guide learners' thinking.

7. The inclusivity principle

Definition

Respect for **diversity** and inclusion are children's rights. They are essential if we want all children to learn and develop to their full potential. Teachers need to be aware of each learner's identity, needs and interests.

Every South African classroom is diverse. There are many different children and each one brings their own identity, personality, capabilities, interests and background. **Inclusivity** is the practice of ensuring that all children, regardless of diversity, are included in all classroom activities, especially those learners who would otherwise be excluded or marginalised. Disability is *one* of the reasons why children are often excluded, but importantly, social, emotional, physical and attitudinal issues also present barriers to learning. Teachers who have an inclusive mindset, welcome and embrace diversity amongst their learners.

Inclusive education means that all children attend school in age-appropriate classes. They are welcomed, encouraged to participate in all aspects of the school and are supported to learn and achieve their full potential.

GLOSSARY

diversity
a range of people with a variety of differences of, for example, identity, personality, capabilities, interests and background

inclusivity
the practice of ensuring that all children, regardless of their differences, are included in all classroom activities

In practice ...

- All learners have a right to feel special, participate and be included in classroom activities and discussions. This includes children who have disabilities, behavioural issues or other barriers to learning.
- All learners, their parents and the school staff should be welcome, included, treated fairly and respected regardless of culture, ethnicity, race, sex, gender identity, sexual orientation, physical or intellectual ability, religion or socio-economic status.

Eka maendlelo ...

- Vadyondzi hi vona va vulavulaka swinene.
- Vadyondzi va khutaziwa ku ringeta mianakanyo na ku endla swihoxo.
- Vadyondzi va avelana miehleketo ya vona na mudyondzisi na vadyondzi lavan'wana.
- Vadyondzisi va yingisela mianakanyo ya vadyondzi.
- Swivutiso swa vadyondzisi hakanyingi swi na makumu yo pfuleka naswona swi letela miehleketo ya vana.

7. Nawu wa nkatsahinkwavo

Nhlamuselo

Nxiximo wa ku **hambana** na ku katsa hinkwavo i timfanelo ta vana. Swa laveka swonghasi loko hi lava vana hinkwavo va dyondza na ku hluvukisa vuswikoti bya vona hi vutalo. Vadyondzisi va fanele ku tiva vutitivisi, swilaveko na minavelo ya mudyondzi un'wana na un'wana.

Kamara rin'wana na rin'wana ro dyondzela ra Afrika-Dzonga ri hambanile. Ku na vana vo tala vo hambanahambana naswona u n'wana na un'wana u tisa vutitivisi, vumunhu, vuswikoti, mitsakelo na mbangu wa yena n'wini. **Nkatsahinkwavo** i endlelo ra ku tiyisisa leswaku vana hinkwavo, swi nga ri na mhaka na ku va hambana, va katsiwa eka migingiriko hinkwayo ya kamara ro dyondzela, ngopfungopfu vadyondzi lava nkarhi wun'wana a va ta va va nga katsiwangi kumbe va tsan'wiwile. Vutsoniwa i *xin'we* xa swivangelo leswi swi endlaka leswaku vana kotala va nga katsiwi, kambe xa nkoka, swiphiqo swa vanhu, swa le moyeni, swa le mirini na swa maehleketelelo na swona swi tisa swirhalanganyi eka ku dyondza. Vadyondzisi lava va nga na miehleketo ya ku katsa hinkwavo, va amukela ku hambana exikarhi va vadyondzi va vona.

Dyondzo ya ku katsa hinkwavo swi vula leswaku vana hinkwavo va nghena xikolo eka titlilasi leti fambelanaka na malembe hi vukhale. Va amukeriwa, va khutaziwa ku teka xiave eka swiphemu hinkwaswo swa xikolo na ku seketeriwa ku dyondza na ku fikelela vuswikoti bya vona hi vutalo.

DLILOSARI

hambana
nxaxamelo wa ku hambana ko hambanahambana, tanihi xikombiso, vutitivisi, vumunhu, vuswikoti, mitsakelo na mbangu

nkatsahinkwavo
endlelo ra ku tiyisisa leswaku vana hinkwavo, swi nga ri na mhaka na ku va hambana, va katsiwa eka migingiriko hinkwayo ya kamara ro dyondzela

Eka maendlelo ...

- Vadyondzi hinkwavo va na mfanelo ya ku titwa va hlawulekile, ku teka xiave na ku katsiwa eka migingiriko na mikanelo ya le kamareni ro dyondzela. Leswi swi katsa vana lava va nga na vutsoniwa, swiphiqo swa mahanyelo kumbe swirhalanganyi swin'wana swa ku dyondza.
- Vadyondzi hinkwavo, vatswari va vona na vatirhi va le xikolweni va fanele ku amukeriwa, va katsiwa, va khomiwa hi ndlela leyinene naswona va xiximi swi nga ri na mhaka mfuwo, rixakamfuwo, rixakanghohe, mbala, rimbewu, vutitivisi bya rimbewu, vutifambelanisi bya rimbewu, vuswikoti bya le mirini kumbe bya le miehleketweni, vukhongeri kumbe xiyimo xa vanhu na ikhonomi.

More about the inclusivity principle

Different learning styles

Diversity is not only about our physical characteristics, beliefs, or faith, it can also include how we learn new skills. Not all children learn in the same way. There is a diverse range of learning styles that are appropriate to each learner. For example, not all learners can follow the teacher's instructions by only listening to what she is saying. Some learners would benefit from seeing a picture that represents what they have to do. Others may need an action or hands-on activity to fully understand an instruction or concept.

In practice ...

Successful teachers are able to identify the learning needs of each learner in their class and to then adapt activities to best suit each learner's needs. The following eight learning styles are appropriate for learning and teaching in Grade R:

- Visual (Spatial): Visual learning involves the use of pictures or diagrams to remember information. Some learners understand and remember information easier when it is represented as pictures or diagrams.
- Auditory (Aural-Musical): Auditory learning depends on listening to information to fully understand and remember it. Some learners learn best when they can listen to the teacher, or to a song or recording.
- Verbal (Linguistic): Verbal learning involves speaking and expressing ideas out loud, and drawing or writing to fully understand and remember information.
- Physical (Kinaesthetic): Physical learning takes place when the learner is involved in a physical, hands-on activity. These learners use their bodies and sense of touch (tactile) to understand information.
- Logical (Mathematical): Logical learning involves the use of logic and reason to make sense of information. Logical learners will use logic and look for reasons when they are learning new things.
- Social (Interpersonal): Social learning involves learning with others. Some learners prefer to learn as part of a group or with a friend.
- Solitary (Intrapersonal): Solitary learning involves learning on your own. Some learners concentrate best when they can focus on their thoughts and feelings on their own, without being distracted by others.
- Naturalist (Nature): Naturalist learning takes place in nature. Some learners learn and understand best when they can explore and investigate nature through outdoor experiences, such as observing animals, gardening, taking care of the earth or exploring the environment.

Swo tala hi mayelana na nawu wa nkatsahinkwavo

Switayili swo hambanahambana swa ku dyondza

Ku hambana a swi hi mayelana ntsena na swihlawulekisi swa hina swa le mirini, swikhorwiwa, kumbe ripfumelo, swi nga tlhela swi katsa hilaha hi dyondzaka hakona swikili swintshwa. A hi vana hinkwavo lava dyondzaka hi ndlela yo fana. Ku na switayili swa ku dyondza swo hambanahambana leswi swi faneleke eka mudyondzi un'wana na un'wana. Tanihi xikombiso, a hi vadyondzi hinkwavo va kotaka ku landzelela swileriso swa mudyondzi hi ku yingisela ntsena leswi a swi vulaka. Vadyondzi van'wana va ta vuyeriwa hi ku vona xifaniso lexi xi yimela leswi va faneleke ku swi endla. Van'wana va nga ha lava xiendlo kumbe nghingiriko wo endla ku twisisa hi vutalo xileriso kumbe nongoti.

Eka maendlelo ...

Vadyondzisi lava humelelaka va kota ku kuma swidingo swa ku dyondza swa mudyondzi un'wana na un'wana loyi a nga etlilasini ya vona kutani endzhaku ka swona va fambelanisa migingiriko ku ringanela kahle swinene swilaveko swa mudyondzi un'wana na un'wana. Switayili leswi swa nhungu swa ku dyondza leswi landzelaka swi fanerile eka madyondzelo na madyondziselo eka Giredi ya V:

- Swo voniwa (Swa ndhawu): Ku dyondza ka swo voniwa ku khumba ntirhiso wa swifaniso kumbe tidayagiramu ku tsundzuka vuxokoxoko. Vadyondzi van'wana va twisisa na tsundzuka vuxokoxoko hi ku olova loko byi andlariwa tanihi swifaniso kumbe tidayagiramu.
- Swo twiwa (Swandleve-Swa vuyimbeleri): Ku dyondza ka swo twiwa ku lawuriwa hi ku yingisela vuxokoxoko hi vutalo na ku byi tsundzuka. Vadyondzi va dyondza kahle swinene loko va yingisela mudyondzisi, kumbe risimu kumbe nkandziyiso.
- Swo marito (Swa ririmi): Ku dyondza ka swo vulavula ku khumba ku vulavula na ku paluxa mianakanyo yi twakala, na ku dirowa kumbe ku tsala ku kota ku twisisa vuxokoxoko hi vutalo na ku byi tsundzuka.
- Swa miri (Swa mfambafambo wa swirho): Ku dyondza ka swa le mirini ku endleka loko mudyondzi a ri eku endleni ka nghingiriko wo endla. Vadyondzi lava va tirhisa miri ya vona na xitwi xo khumba (ku khoma) ku kota ku twisisa vuxokoxoko.
- Swo landzeleriseka (Swa matematiki): Ku dyondza ko landzeleriseka ku khumba ntirhiso wa vulandzeleriseki na xivangelo ku kota ku twisisa vuxokoxoko. Vadyondzi vo landzelerisa va tirhisa vulandzeleriseki na ku lava swivangelo swa loko va ri eku dyondzeni ka swilo swintshwa.
- Swin'we na vanhu (Swa le xikarhi ka vanhu): Ku dyondza swin'we na vanhu swi khumba ku dyondza na van'wana. Vadyondzi van'wana va tsakela ku dyondza tanihi xiphemu xa ntlawa kumbe na munghana.
- A ri yexe (Munhu a ri yexe exikarhi ka van'wana): Ku dyondza a ri yexe swi khumba ku dyondza u ri wexe. Vadyondzi van'wana va kongomisa miehleketo kahle swinene loko va kota ku kongomisa miehleketo na matitwelo ya vona loko va ri voxe, handle ku yiviwa miehleketo hi van'wana.
- Mutivantumbuluko (Ntumbuluko): Ku dyondza ka mutivantumbuluko swi humelela eka ntumbuluko. Vadyondzi van'wana va dyondza na ku twisisa kahle swinene loko va kota ku valanga na ku lavisisa ntumbuluko hi ku tirhisa mitokoto ya le handle ka miako, yo tanihi ku xiyaxiya swiharhi, xirhapa, ku hlayisa misava kumbe ku valanga mbangu.

Barriers to learning maths

A **barrier to learning** is anything that prevents a child from being able to learn effectively. Barriers can be linked directly to the child (intrinsic), for example, cognitive impairment, grief or a broken arm. Barriers can also be outside of the child (extrinsic), for example, poverty, neglect or an overcrowded classroom.

Language is a very important learning tool. In South Africa this often presents as both an intrinsic and extrinsic barrier to learning, particularly where a child's home language is different from the language of teaching and learning.

Many children experience one or more barriers to learning. They may need more practice and support than other learners do. Barriers to learning are factors that make it difficult for some learners to learn maths. Examples of barriers are shown in the following diagram.

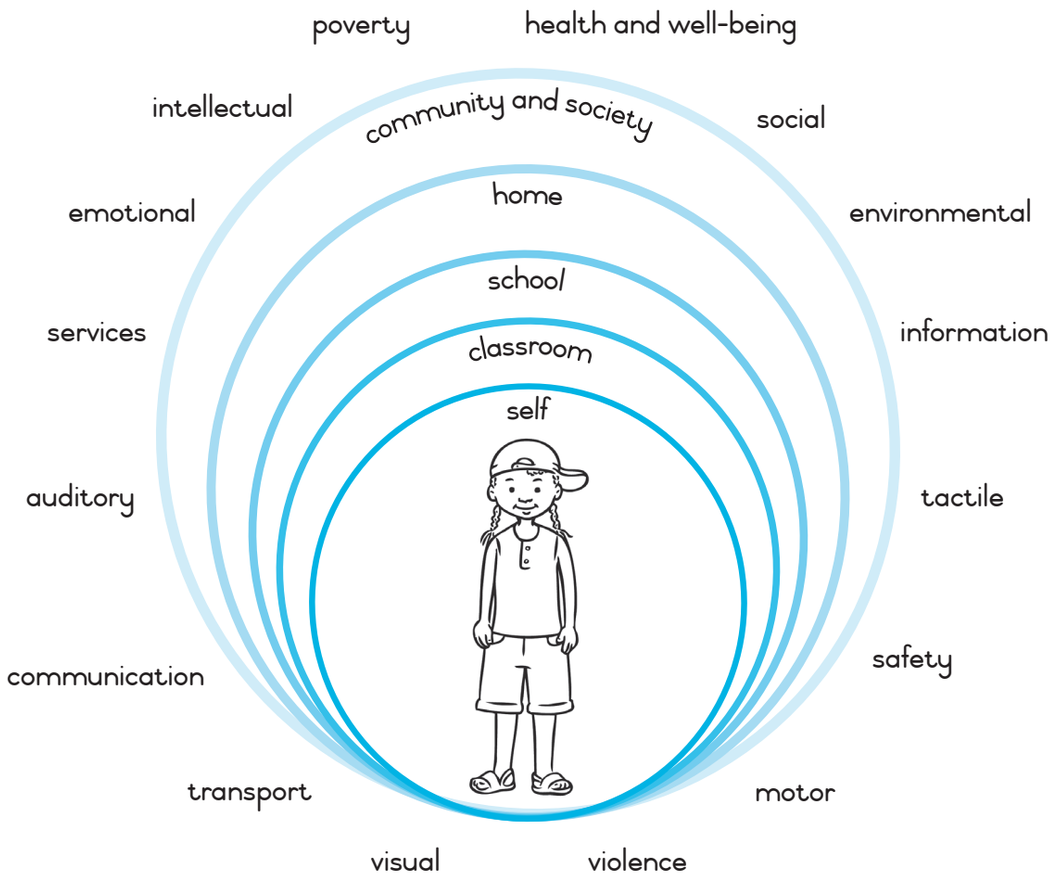


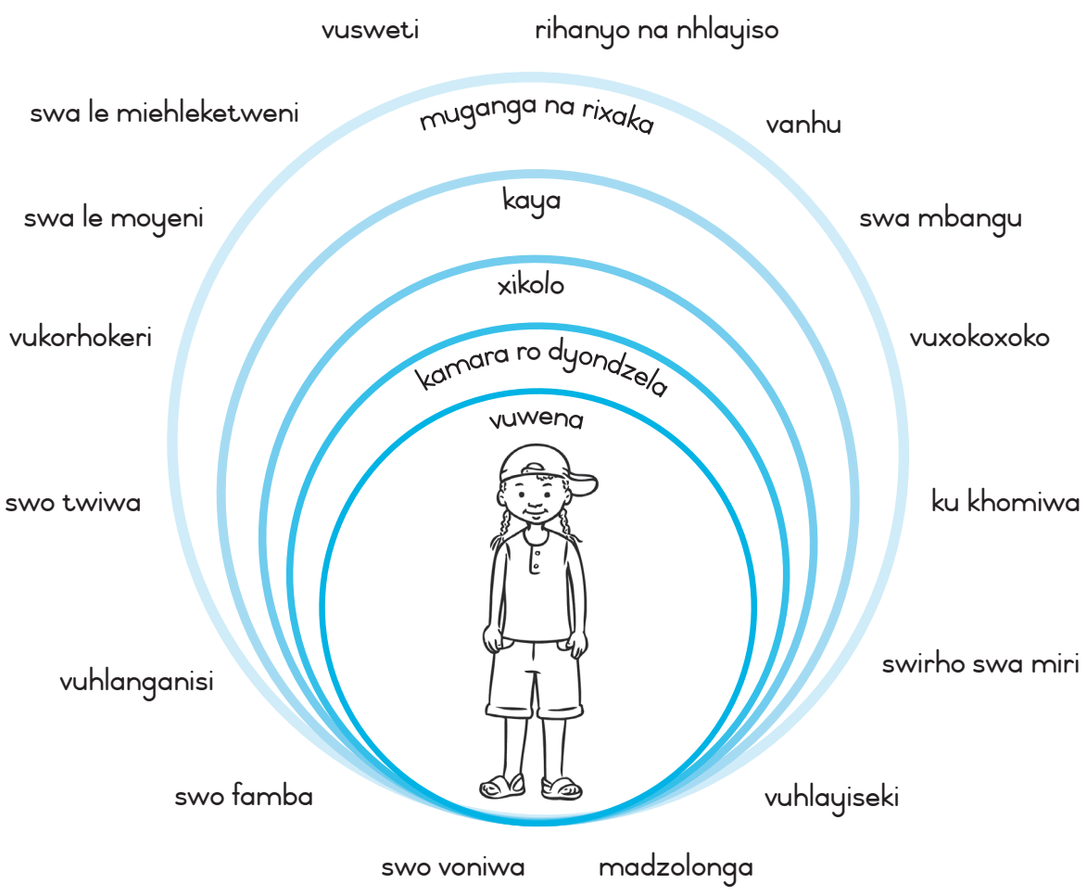
Figure 29 Barriers to learning

Swirhalanganyi swa ku dyondza matematiki

Xirhalanganyi xa ku dyondza xilo xihi kumbe xihi lexi xi sivelaka mudyondzi eka ku dyondza hi ndlela ya kahle. Swirhalanganyi swi nga fambelanisiwa na n'wana hi ku kongoma (swa le ndzeni), tanihi xikombiso, ntsandzeko wa ku twisisa, gome kumbe voko leri tshovekeke. Swirhalanganyi swi nga tlhela swi va ehandle ka n'wana (swa le handle), tanihi xikombiso, vusweti, ku lahliwa kumbe kamara ro dyondzela leri nga tala kutlula mpimo.

Ririmi i xitirho xa nkoka swinene swa ku dyondza. EAfrika-Dzonga kotala leswi swi tisa tanihi xirhalanganyi xa ku dyondza xa le ndzeni na xa le handle, ngopfungopfu laha ririmi ra lekaya ra n'wana ri nga hambana na ririmi ra ku dyondzisa na ku dyondza.

Vana vo tala va hlangana na xirhalanganyi xa ku dyondza xin'we kumbe kutlula. Va nga ha lava vutitoloveti na nseketelo wo tala kutlula lowu vadyondzi van'wana va wu lavaka. Swirhalanganyi swa ku dyondza i swiphemu leswi swi vangaka ku tikeriwa eka vadyondzi van'wana ku dyondza matematiki. Swikombiso swa swirhalanganyi swi kombiwile eka dayagiramu leyi landzelaka.



Xifaniso xa 29 Swirhalanganyi swa ku dyondza

In practice ...

Some of the ways in which you can include all learners in your Grade R classroom are the following:

- Plan your lessons, activities and materials to make them suitable for the needs of different learners, e.g. a maths problem based on a picture might need to include a detailed description in order to help a learner to focus on the important aspects of the picture.
- Use many different practical activities with real objects.
- Allow learners more time and support to complete activities, to think and/or to answer questions, if they need it.
- It may be helpful to discuss, with a colleague or the school support team, the level you are working at with a learner to make sure you are offering him/her the best support possible. You may also need to follow up with the child's parents or caregivers and the district-based support team to provide the learner with all possible opportunities for learning and development.

Schools must ensure that all classrooms and teachers have adequate and appropriate resources to accommodate all the learners, despite barriers to learning. This includes:

- teachers trained to identify barriers to learning
- diverse teaching strategies
- an adequate classroom set up
- managed class size
- classroom assistants.

In practice ...

- Screen all learners when they are admitted to Grade R and record your findings on a Learner Profile according to the national policy on Screening, Identification, Assessment and Support (SIAS) for all learners.
- Develop an Individual Support Plan (ISP) for any learners experiencing barriers to learning. This information should be shared with the parents and/or caregivers so that they are aware of any additional needs and the support plan for their child.
- Collaborate with the School Based Support Team to provide the necessary support. A learner is referred to the District Based Support Team if additional support is required.

Eka maendlelo ...

Tin'wana ta tindlela leti u katsaka vadyondzi hinkwavo hatona eka kamara ro dyondzela ra Giredi ya V ti katsa leti landzelaka:

- Kunguhata tidyondzotsongo ta wena, migingiriko na timatheriyali ku ti endla ti ringanela swilaveko swa vadyondzi vo hambanahambana, xik. xiphiqo xa matematiki lexi simekiweke eka xifaniso xi nga ha lava ku katsa nhlamuselo leyi koxometaka hi xikongomelo xa ku pfuna mudyondzisi ku kongomisa eka swiphemu swa nkoka sw xifaniso.
- Tirhisa migingiriko yo endla yo hambanahambana yo tala hi michumu ya xiviri.
- Pfumelela vadyondzi nkarhi na seketelo wo tala ku hetisa migingiriko, ku ehleketa na kumbe/ku hlamula swivutiso, loko va wu lava.
- Swi nga ha pfuna ku kanela, na mutirhikulobye kumbe xipano xo seketela xa le xikolweni, levhele leyi u tirhaka hayona na mudyondzi ku tiyisisa leswaku u va eku n'wi nyikeni ka nseketelo wa kahle swinene lowu kotekaka. U nga tlhela u lava ku landzelerisa na vatswari kumbe vahlayisi va n'wana loyi na xipano xo seketela xa le ka xifundzatsongo ku nyika mudyondzi loyi swivandlanene leswi kotekaka hinkwaswo swa ku dyondza na nhluvukiso.

Swikolo swi boheka ku tiyisisa leswaku tikamara to dyondzela hinkwato na vadyondzisi va va na swipfuno swo enela leswi faneleke ku amukela vadyondzi hinkwavo, swi nga ri na mhaka swirhalanganyi swa ku dyondza. Leswi swi katsa:

- vadyondzisi va leteriwa ku kuma swirhalanganyi swa ku dyondza
- maqhinga ya madyondziselo yo hambana
- malulamiselo ya kamara ro dyondzela yo enela
- sayizi ya tlilasi leyi lawuriwaka
- vapfuni va le ka kamara ro dyondzela.

Eka maendlelo ...

- Hlela vadyondzi hinkwavo loko va amukeriwa eka Giredi ya V kutani u rhekoda swikumiwa swa wena eka Phurofayili ya Mudyondzi hi ku ya hi pholisi ya rixaka eka Vuhleri, Vutivisi, Makambelelo na Nseketelo (Screening, Identification, Assessment and Support (SIAS)) ya vadyondzi hinkwavo.
- Endla Kungu ro Seketela Munhu (Individual Support Plan (ISP)) ra vadyondzi vahi kumbe vahi lava hlangana na swirhalanganyi swa ku dyondza. Vuxokoxoko byi fanele ku avelaniwa na vatswari na/kumbe vahlayisi ku endlela leswaku va tiva swilaveko swo engetela swihi kumbe swihi na kungu ro seketela ra n'wana wa vona.
- Tirhisana na Xipano xa Nseketela xa Xikolo ku nyika nseketelo lowu lavekaka. Mudyondzi u rhumeriwa eka Xipano xa Neketela xa Xifundzatsongo loko ku laveka nseketelo wo engetela.

Perceptual and motor development

The development of perceptual and motor skills in young learners is extremely important in laying a foundation for all future maths development and learning. Sensory perception means using the senses to get information about the environment. Sensory perceptual skills are important for learning maths because they help us understand:

- the way things are linked
- similarities and differences
- size, shape and pattern
- space and position
- symbols and their meanings.

Perceptual skills allow us to make sense of the world around us. Sensory information is collected by our five senses, for example, what our eyes see, ears hear, skin feels, tongue tastes and nose smells.

This information is sent to our brain. The brain processes, organises and remembers this information so that we can use it later for everyday activities, such as reading, drawing, writing, cutting, completing puzzles, completing maths problems, enjoying a story, dressing, finding our shoes in the cupboard, singing, as well as many other skills.

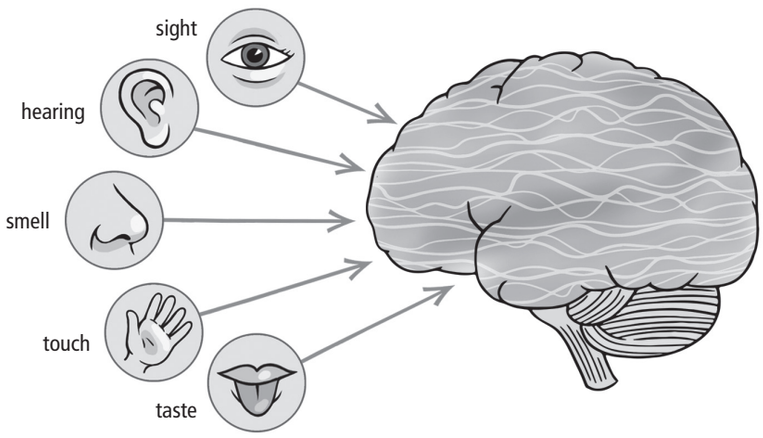


Figure 30 Our five senses

In practice ...

Observe learners playing outside and inside with different equipment.

Can they:

- tell the difference between different sounds, different words?
- spot the difference between two pictures or groups of objects?
- remember what they have seen and heard?
- repeat a list of words or numbers in the correct order?
- respond to different sounds, their names, instructions?
- feel the difference between smooth and rough?
- taste the difference between sweet and sour while blindfolded?

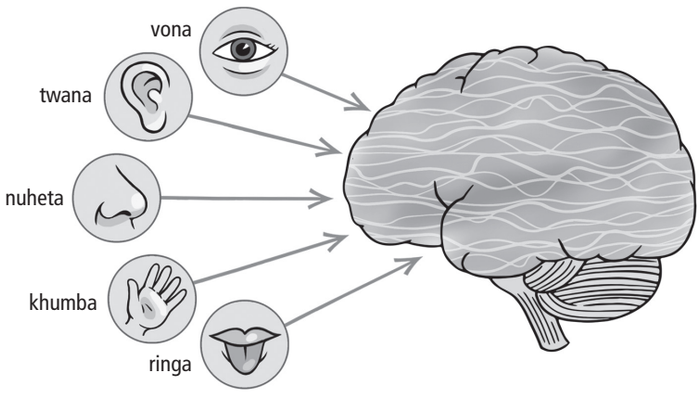
Nhluvukiso wo tirhisa swirho u ri karhi u vona

Nhluvukiso wa swikili swo tirhisa swirho u ri karhi u vona eka vadyondzi lavatsongo i swa nkoka kutlula mpimo eka ku vumba masungulo ya nhluvukiso na ku dyondza ka matematiki wa nkarhi lowutaka hinkwawo. Ndzemuko wa switwi swi vula ku tirhisa switwi ku kuma vuxokoxoko hi mayelana na mbangu. Swikili swo vona hi switwi i swa nkoka eka ku dyondza matematiki hikuva swi hi pfuna ku twisisa:

- ndlela leyi swilo swi nga na vuxaka hayona
- ku fanana na ku hambana
- sayizi, xivumbeko na patironi
- ndhawu na xiyimo
- mifungho na tinhlamuselo ta yona.

Swikili swo voniwa swi hi pfumelela ku twisisa swivandla leswi nga ekusuhi na hina. Vuxokoxoko lebyi taka hi switwi byi hlengeletiwa hi ntlhanu wa switwi swa hina, tanihi xikombiso, leswi mahlo ya hina ya swi vonaka, tindleve ta hina ti swi twaka, nhlonge ya hina yi swi khumbhaka, ririmi ra hina ri swi ringaka na nhompfu ya hina yi swi nuhetaka.

Mahungu ya rhumeriwa ebyongweni. Byongo byi hluta, byi lulamisa na ku tsundzuka vuxokoxoko lebyi ku endlela leswaku hi byi tirhisa eka nkarhi lowu taka eka migingiriko ya masiku hinkwawo, yo tanihi ku hlaya, ku dirowa, ku tsala, ku tsema, ku hetisa swiphazamiso, ku hetisa swiphiqo swa matematiki, ku tiphina hi xitori, ku ambala, ku kuma tintangu ta wena ekhabodweni, ku yimbelela xikan'we na swikili swin'wana.



Xifaniso xa 30 Switwi swa hina swa ntlhanu

Eka maendlelo ...

Xiya vadyondzi loko va ri eku tlangeni ehandle na le ndzeni hi switirhisiwa swo hambanahambana.

Xana va kota ku:

- vula ku hambana exikarhi ka mipfumawulo yo hambanahambana, marito yo hambanahambana?
- vona ku hambana exikarhi ka swifaniso swimbirhi kumbe mitlawa mimbirhi ya michumu?
- tsundzuka leswi va swi voneke na ku swi twa?
- vuyelela nongoloko wa marito kumbe tinomboro hi malongolokelo lama nga lulama?
- angula eka mipfumawulo yo hambanahambana, mavito ya yona, swileriso?
- twa ku hambana exikarhi ka swo rhetela na swo khwaxa?
- ringa ku hambana exikarhi ka swo nyanganya na swo dzunga loko va pfariwile mahlo?

Motor skills are actions that involve using our muscles. We use the big muscles in our bodies for gross motor activities, e.g. kicking a ball, running and jumping. We use smaller muscles for fine motor activities, e.g. cutting, writing and drawing.

Sensory perceptual motor development includes the following:

- visual perception
- auditory perception
- tactile perception
- kinaesthetic perception.

Grade R Maths recognises the importance of these skills for the development of maths concepts in Grade R learners.

Visual perception

Visual perception is the ability of the brain to use what the eyes see and to interpret this information. Visual perception skills are important for manipulating objects, drawing, reading and writing in maths.

Visual discrimination

Visual discrimination is the ability to see similarities and differences between objects. For example, to recognise what is the same and what is different between 2-D shapes, such as a picture of a square and a rectangle.

Visual motor coordination

Visual motor coordination is the ability of the eyes, brain and body muscles to work together to perform actions. In maths, it is important for activities, such as handling objects, drawing and writing.

Activities that help develop visual motor coordination include:

- ball and beanbag games
- using building blocks
- playing with objects that roll or slide
- drawing patterns
- cutting and pasting
- threading.

Visual closure

Visual closure is the ability to complete objects, pictures or drawings that are incomplete. In other words, the learner is able to recognise or identify a whole object even though the total picture is incomplete. Learners who struggle with visual closure will, for example, find it difficult to complete puzzles. They may also have difficulty describing what is missing in a picture that shows only the right side of the face or body, or completing the picture.

Swikili swo tirhisa swirho swa miri i swiendlo leswi swi katsaka ku tirhisa mipfimbi ya wena. Hi tirhisa mipfimbi leyikulu leyi nga emirini ya hina eka migingiriko leyikulu yo tirhisa swirho swa miri hinkwawo, xik. ku raha bolo, ku tsutsuma na ku tlula. Hi tirhisa mipfimbi leyitsongo eka migingiriko leyitsongo yo tirhisa swirho swa miri, xik. ku tsema, ku tsala na ku dirowa.

Nhluvukiso wo tirhisa swirho swa miri u ri karhi u vona na ku twa wu katsa leswi landzelaka:

- ndzemuko wa swo voniwa
- ndzemuko wa swo twiwa
- ndzemuko wa swo khomiwa
- ndzemuko wa swirho swa miri.

Grade R Maths wu tekela enhlokweni nkoka wa swikili leswi nga eka nhluvukiso wa minongoti ya matematiki eka vadyondzi va Giredi ya V.

Ndzemuko wa swo voniwa
Ndzemuko wa swo voniwa i vuswikoti bya byongo ku tirhisa mahlo ku vona na ku humesa nhlamuselo ya vuxokoxoko lebyi. Swikili swa ku vona swo voniwa i swa nkoka eka ku lawula michumu, ku dirowa, ku hlaya na ku tsala eka matematiki.

Vuhambanisi bya swo voniwa

Vuhambanisi bya swo voniwa i vuswikoti bya ku vona ku fana na ku hambanaka exikarhi ka michumu. Tanihi xikombiso, ku lemuka leswi swi fanaka na leswi swi nga hambana exikarhi ka swivumbeko swa 2-D swo tanihi xifaniso xa xikwere na rhekithengele.

Ntirhisano wa swirho swa miri swo voniwa

Ntirhisano wa swirho swa miri swo voniwa i vuswikoti bya mahlo, byongo na mipfimbi ya miri ku tirhisana ku endla swiendlo. Eka matematiki, i swa nkoka eka migingiriko yo tanihi ku khoma michumu, ku dirowa na ku tsala.

Migingiriko leyi yi pfunaka ku kurisa ntirhisano wa swirho swa miri swo voniwa yi katsa:

- mitlangu ya bolo na ya nkwama wo fotomela
- ku tirhisa tibuloko to aka
- ku tlanga hi michumu leyi khungulukaka kumbe yi rhetaka
- ku dirowa tipatironi
- ku tsema na ku damarheta
- ku hulela.

Ku pfariwa ka swo voniwa

Ku pfariwa ka swo voniwa i vuswikoti bya ku hetisa michumu, swifaniso kumbe swidirowiwa leswi nga hetisekangiki. Hi marito man'wana, mudyondzi u kota ku lemuka kumbe ku tiva nchumu hinkwawo hambiloko xifaniso hinkwaxo xi nga hetisekangi. Vadyondzi lava va kayakayaka hi ku pfariwa ka swo voniwa, tanihi xikombiso, va kuma swi tika ku hetisa swiphazamiso. Va nga ha tlhela va va na ku tikeriwa ku hlamusela leswi swi kayivelaka exifanisweni lexi xi kombaka tlhelo ra xinene ntsena ra xikandza kumbe miri, kumbe ku hetisa xifaniso.

Form constancy and form perception (recognition)

Form constancy is the ability to tell the difference between forms and symbols, even though their size and position might change. In other words, it means being able to recognise the constant characteristics of something. For example, a circle is a circle because of its shape. It remains a circle even if it is blue, purple, large or small, in a book or drawn in the sand. In the same way, the number symbol '5' remains the same whether it is written in different colours or in big or small writing.

Visual figure-ground perception

Visual figure-ground perception is the ability to recognise the difference between objects that are in the foreground and those that are in the background. You can help learners to develop this skill by asking them to identify particular objects in a picture or in a collection of objects, e.g. 'Find the girl with red pants in the picture' or 'Find the box with oranges in the picture' or 'Find your shoes in this pile of all of our shoes'.

Visual sequencing

Visual sequencing is the ability to place objects or items in the correct order after looking at them or observing them. Help learners to develop this skill by asking them to look at a pattern of different coloured beads on a string and then repeat the pattern themselves.

Visual motor integration

Visual motor integration is the ability to make sense of visual information and then use it in another activity that uses motor skills. Learners use visual information and fine motor skills when, for example, they copy numbers or draw objects in front of them.

Visual conceptualising

Visual conceptualising is the ability to make pictures in your mind (mental images) based on experiences, observations or other visual information. Learners use this skill when, for example, they draw pictures of something like a room in their homes or of their families.

Endla leswaku swi nga cinci u tlhela u endla swo voniwa (ndzemuko)

Ku endla leswaku swi nga cinci i vuswikoti bya ku vula ku hambana ka swivumbeko na mifungho, hambiloko sayizi na xiyimo xa swona xi nga ha cinca. Hi marito man'wana, swi vula ku va u kota ku lemuka swihlawulekisi leswi nga cinciki swa xin'wana. Tanihi xikombiso, xirhendzevutana i xirhendzevutana hikwalaho ka xivumbeko xa xona. Xi tshama xi ri xirhendzevutana hambiloko xi ri xa wasi, xa xivunguvungu, lexikulu kumbe lexitsongo, xi ri ebukwini kumbe xi dirowiwile emisaveni. Hi ndlela yo fana, mfungho wa nomboro '5' wu tshama wu ri karhi wu fana hambiloko wu tsariwile hi mihlovo yo hambanahambana kumbe wu ri matsalelo lamakulu kumbe lamatsongo.

Ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni swo voniwa

Ndzemuko wa swifaniso swa swivumbeko swo ka swi ri nga erivaleni swo voniwa i vuswikoti bya ku lemuka ku hambana exikarhi ka michumu leyi nga emahlweni na leyi yi nga endzhaku. U nga pfuna vadyondzi ku kurisa xikili lexi hi ku va vutisa ku kuma michumu yo karhi leyi nga exifanisweni kumbe eka nhlengelo wa michumu, xik. 'Kuma nhwanyana loyi a nga ambala buruku yo tshwuka exifanisweni' kumbe 'Kuma bokisi leri nga na malamula exifanisweni' kumbe 'Kuma tintangu ta wena enhulwini ya hinkwato ta tintangu ta wena'.

Ku longoloxa swo voniwa

Ku longoloxa swo voniwa i vuswikoti bya ku veka michumu hi malongolokelo lama nga lulama endzhaku ka ku yi languta kumbe ku yi xiya. Pfuna vadyondzi ku hluvukisa xikili lexi hi ku va kombela ku languta patironi ya vuhlalu lebyi hlovohatiweke ku hambana enjareni kutani endzhaku ka swona va vuyelela patironi leyi hi voxe.

Mpfanganiso wa swirho swa miri wa swo voniwa

Mpfanganiso wa swirho swa miri wo voniwa i vuswikoti bya ku twisisa vuxokoxoko bya swo voniwa kutani endzhaku ka swona u byi tirhisa eka nghingiriko wun'wana lowu wu tirhisaka swikili swa swirho swa miri. Vadyondzi va tirhisa vuxokoxoko na swikili swa swirho swa miri leswitsongo, tanihi xikombiso, loko va kopunula tinomboro kumbe ku dirowa michumu leyi nga emahlweni ka vona.

Ku vumba nongoti wa swo voniwa

Ku vumba nongoti wa swo voniwa i vuswikoti bya ku endla swifaniso emiehleketweni (swifaniso swa le miehleketweni) leswi simekiweke eka mitokoto, mixiyaxiyo kumbe vuxokoxoko byin'wana bya swo voniwa. Vadyondzi va tirhisa xikili lexi, tanihi xikombiso loko va dirowa swifaniso swa swin'wana ku fana na kamara leri nga emakaya ya vona kumbe mindyangwini ya ka vona.

Auditory perception

Auditory perception is the ability of the brain to use what the ears hear and to interpret this information. Auditory perception is important for developing language skills, following and understanding instructions as well as sharing and discussing ideas and information.

Auditory discrimination

Auditory discrimination is the ability to recognise similarities and differences in sound, e.g. being able to hear the difference between the words 'rectangle' and 'triangle'.

Auditory memory

Auditory memory is the ability to store and remember something you have heard. Learners use this skill when they follow a set of instructions or repeat a number sequence that is read aloud, e.g. 4, 6, 8, 1.

Auditory figure-ground perception

Auditory figure-ground perception is the ability to recognise or isolate a sound from other sounds. It is also the ability to focus on a particular sound separately from background noise. This skill allows learners to focus on what someone in their group is saying without being distracted by the noise of other groups talking.

Auditory sequencing

Auditory sequencing is the ability to remember the objects or items in the correct order after hearing a list. For example, the order of the numbers from 1 to 10 or months of the year. Asking learners to describe a few of the day's events in order helps to develop this skill.

Tactile and kinaesthetic perception

Tactile perception is the ability to use the sense of touch to explore your environment. Kinaesthetic perception is the awareness of body movements and position in space. They work together to provide the brain with information. An activity that helps to develop learners' tactile and kinaesthetic perception is to ask learners to shut their eyes, then to feel and describe a number of different objects in a bag or pillowcase. For example, they could say it has corners or it is round.

Ndzemuko wa swo twiwa
Ndzemuko wa swo twiwa i vuswikoti bya byongo ku tirhisa leswi tindleve ti swi twaka na ku humesa nhlamuselo ya vuxokoxoko lebyi. Ndzemuko wa swo twiwa i wa nkoka eka ku hluvukisa swikili swa ririmi, ku landzelela na ku twisisa swileriso xikan'we na ku avelana na ku kanela mianakanyo na vuxokoxoko.

Vuhambanisi bya swo twiwa

Vuhambanisi bya swo twiwa i vuswikoti bya ku lemuka ku fana na ku hambana eka mpfumawulo, xik. ku va u kota ku twa ku hambana exikarhi ka marito 'yinhlamune' na 'yinhlanharhu'.

Vutsundzuki bya swo twiwa

Vutsundzuki bya swo twiwa i vuswikoti bya ku tsundzuka swin'wana leswi u swi tweke. Vadyondzi va tirhisa xikili lexi loko va landzelela xikatsa xa swileriso kumbe ku vuyelela malongolokelo ya tinomboro lama hlayeriwaka ehenhla, xik. 4, 6, 8, 1.

Ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni swo twiwa

Ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni swo twiwa i vuswikoti bya ku lemuka kumbe ku hambanisa mpfumawulo eka mipfumawulo yin'wana. Wu tlhela wu va vuswikoti bya ku kongomisa eka mpfumawulo wo karhi hi ku hambana kusuka eka pongo ra le ndhawini. Xikili lexi xi pfumelela vadyondzi ku kongomisa eka leswi munhu un'wana entlaweni wa vona a swi vulaka handle ka ku yiviwa miehleketo hi pongo ra mitlawa yin'wana leyi nga eku vulavuleni.

Ku longoloxa swo twiwa

Ku longoloxa swo twiwa i vuswikoti bya ku tsundzuka michumu hi malongolokelo lama nga lulama endzhaku ka ku twa nongonoko. Tanihi xikombiso, malongolokelo ya tinomboro kusuka eka 1 kufika eka 10 kumbe tin'hweti ta lembe. Ku kombela vadyondzi ku hlamusela switsongo swa swiendleko swa siku hi ku longoloka swi pfuna ku hluvukisa xikili lexi.

Ku vona swo khomiwa na ku tirhisa swirho swa miri
Ndzemuko wa swo khomiwa i vuswikoti bya ku tirhisa xitwi xa ku khumba ku valanga mbangu. Ndzemuko wa swirho swa miri i vulemuki bya mifambafambo wa swirho swa miri na xiyimo endhawini. Swa tirhisana ku nyika byongo vuxokoxoko. Nghingiriko lowu wu pfunaka ku hluvukisa ku vona na swo khomiwa na swirho swa miri ka vadyondzi i ku kombela vadyondzi ku pfala mahlo ya vona, kutani va twa na ku hlamusela nhlayo ya michumu yo hambanahambana leyi nga ebegeni kumbe exikhegelweni. Tanihi xikombiso, va nga vula loko xi ri na tikhona kumbe xi ri xa xirhendzevutana.

8. The practice principle

Definition

Learners should have plenty of time to practise new skills and knowledge. When learners get regular practice in what they have already learnt, they get better at it and become more confident. They enjoy repetition and practice. The Grade R teacher should provide repeated opportunities for learners to practise and improve new skills.

In practice ...

- Counting and problem solving are done every day as regular activities – even if the focus is on other concepts, such as shape or measurement.
- Provide varied materials and tasks so that learners can practise newly learnt skills in different ways.
- Maths concepts can also be practised across the curriculum, for example, in Home Language and Life Skills activities, such as stories, drama, painting and obstacle courses.

More about the practice principle

Using rhymes, songs and stories

Singing songs and repeating rhymes together, and sharing stories is an enjoyable, non-competitive way of learning. Children learn maths concepts and skills when they repeat rhymes and songs, and listen to stories again and again. They learn and practise:

- number names (e.g. 'There were three little meerkats …')
- the order of number names
- forward and backward counting
- counting groups of things
- informal calculations, e.g. adding and subtracting
- the sequence of events.

In practice ...

- Add movement, rhythm and music to songs, rhymes and stories to make them even more enjoyable. Experiences that use all our senses help learners to remember things more easily.
- Encourage parents and other caregivers to learn the stories, songs and rhymes you use with the learners. In this way, they become an important link for children between home and school activities.

8. Nawu wo titoloveta

Nhlamuselo

Vadyondzi va fanele ku va na nkarhi wo tala wa ku titoloveta swikili na vutivi lebyintshwa. Loko vadyondzi va kuma vutitoloveti bya nkarhi na nkarhi eka leswi se va swi dyondzeke, va antswa eka swona na ku va na vutitshembi swinene. Va tiphina hi mbuyelelo na vutitoloveti. Mudyondzisi wa Giredi ya V u fanele ku nyika swivandlanene leswi vuyeleriwaka swa vadyondzi ku titoloveta na ku antswisa swikili leswintshwa.

Eka maendlelo ...

- Ku hlayela na ku ololoxa swiphiqo swi endliwa masiku hinkwawo tanihi migingiriko ya nkarhi na nkarhi – hambiloko nkongomo wu ri eka minongoti yin'wana yo tanihi xivumbeko na mpimo.
- Nyika timatheriyali na mitirho leswi hambanisiweke ku endlela leswaku vadyondzi va kota ku titoloveta swikili leswa ha ku dyondziwaka hi tindlela to hambana.
- Minongoti ya matematiki yi nga tlhela yi titolovetiwa eka kharikhulamu hinkwayo, tanihi xikombiso eka migingiriko ya Ririmi ra le Kaya na Swikili swa Vutomi yo tanihi switori, ntlangu, ku penda na tindlela ta swirhalanganyi.

Swo tala hi mayelana na nawu wo titoloveta

Ku tirhisa tirhayimi, tinsimu na switori

Ku yimbelela tinsimu na ku vuyelela tirhayimi mi ri swin'we, na ku avelana switori i ndlela ya ku dyondza ya ku nga phikizani, yo tsakisa. Vana va dyondza minongoti na swikili swa matematiki loko va vuyelela tirhayimi na tinsimu, na loko va yingisela switori hi ku vuyelela. Va dyondza na ku titoloveta:

- mavito ya tinomboro (xik. 'A ku ri na tinsimba tinharhu letitsongo …')
- nongoloko wa mavito ya tinomboro
- ku hlayela ku ya emahlweni na le ndzhaku
- ku hlayela mitlawa ya swilo
- makhakhuletelo ya nkamafundza, xik. ku hlanganisa na ku susa
- nongoloko wa swiendleko.

Eka maendlelo ...

- Engetela mfambafambo, nsumo na vuyimbeleri eka tinsimu, tirhayimi na switori ku endla leswaku swi tsakisa swinene. Mitokoto leyi yi tirhisaka switwi swa hina hinkwaswo yi pfuna vadyondzi ku tsundzuka swilo hi ku olova swinene.
- Khutaza vatswari na vahlayisi van'wana ku dyondza switori, tinsimu na tirhayimi leti u ti tirhisaka na vadyondzi. Hi ndlela leyi, va va xihlanganisi xa nkoka xa vana exikarhi ka migingiriko ya le kaya na ya le xikolweni.

Maths integration across the Grade R daily programme

Teachers need to make connections between maths, the daily routine and other subjects (e.g. Home Language and Life Skills), as well as between maths and learners' daily lives. Teachers should take advantage of all opportunities to practise maths skills.

In practice ...

Learners are more likely to show an interest in learning maths, and find it easier to understand, if they can see how maths has meaning and usefulness in their own lives. Teachers can help by doing the following:

- Being more aware of how maths is part of their own personal and professional lives.
- Showing learners how maths is used in daily life, e.g. when you use money to buy something.
- Integrating maths activities into other classroom and outdoors experiences, such as:
  - using ordinal numbers 'first', 'second' and 'third' when learners line up
  - referring to position and direction when learners are playing
  - talking about 'more' and 'less' when learners share fruit, bread and/or juice.
- Making connections with maths concepts, such as size, measurement, time, estimation, counting, comparisons, shape and/or distance when you read stories to the learners.

Teach maths concepts during the Grade R maths focus time and look for other opportunities to develop maths language and concepts throughout the day. This:

- helps learners develop an understanding of how different areas of knowledge are related
- ensures a more holistic or complete learning experience
- gives learners more opportunities to practise what they have learnt.

Mpfanganiso wa matematiki eka nongonoko hinkwawo wa siku na siku wa Giredi ya V

Vadyondzisi va endla vuxaka exikarhi ka matematiki, nghingiriko wa siku na siku na tidyondzo tin'wana (xik. Ririmi ra le Kaya na Swikili swa Vutomi), xikan'we na le xikarhi ka matematiki na vutomi bya vadyondzi bya siku na siku. Vadyondzi va fanele va tirhisa swinene swivandlanene hinkwaswo ku titoloveta swikili swa matematiki.

Eka maendlelo ...

Vadyondzi va tala swinene ku komba ntsakelo eka ku dyondza matematiki, naswona va kuma swi olova swinene ku twisisa, loko va kota ku vona hilaha matematiki wu nga na nkoka na ku pfuna hakona evuton'wini bya vona. Vadyondzisi va nga pfuna hi ku endla leswi landzelaka:

- Hi ku tiva swinene hilaha matematiki wu nga xiphemu hakona xa vutomi bya vona vini na bya xiphurofexinali.
- Ku komba vadyondzi hilaha matematiki wu tirhisiwaka hakona evuton'wini bya siku na siku, xik. loko u tirhisa mali ku xava swin'wana.
- Ku pfanganisa eka mitokoto yin'wana ya le ndzeni ka kamara ro dyondzela na ya le handle ka miako, yo tanihi:
  - ku tirhisa tinomboro ta odinali 'vun'we', 'vumbirhi' na 'vunharhu' loko vadyondzi va fola layini
  - ku kongomisa eka xiyimo na tlhelo loko vadyondzi va ri eku tlangeni
  - ku vulavula hi mayelana na 'tala' na 'ntsongo' loko vadyondzi va avelana mihandzu, xinkwa na/kumbe juzi.
- Ku vumba vuxaka hi minongoti ya matematiki yo tanihi, sayizi, mpimo, nkarhi, nkumbetelo, nhlayelo, mfananiso, xivumbeko na/kumbe mpfhuka loko u hlayela vadyondzi switori.

Dyondzisa minongoti ya matematiki hi nkarhi wa nkongomo wa matematiki wa Giredi ya V kutani u lava swivandlanene swin'wana swa ku hluvukisa ririmi ra matematiki na minongoti ya matematiki siku hinkwaro. Leswi:

- swi pfuna vadyondzi ku hluvukisa ntwisiso wa hilaha swiyenge swo hambanahambana swa vutivi swi nga na vuxaka hakona
- swi endla leswaku ku va na ntokoto wa ku dyondza wo angarhela kumbe lowu hetisekeke
- nyika vadyondzi swivandlanene swo tala ku titoloveta leswi va swi dyondzeke.

SECTION 2

Mathematics in the Grade R Daily Programme

Introduction

The Grade R Maths programme has been developed to strengthen and support the Grade R Mathematics curriculum. Grade R Maths:

- includes and extends the CAPS Grade R Mathematics content outlined in the five Content Areas
- encourages inquiry-based learning by suggesting ways to extend learners' natural curiosity to explore their surroundings
- provides activities that encourage learners to investigate and explore maths concepts
- encourages teachers to talk with learners about their thinking and to help them express their ideas
- suggests ways for learners to plan, observe and gather information, and then to compare, sort, classify and interpret their findings
- provides appropriate materials and resources.

Mathematics Content Areas

Mathematics in the Foundation Phase (including Grade R) covers five Content Areas. Each Content Area contributes towards the learner developing specific maths knowledge and skills. The Content Areas are:

- Numbers, Operations and Relationships
- Patterns, Functions and Algebra
- Space and Shape (Geometry)
- Measurement
- Data Handling

You can find out more about each Content Area in the CAPS and in Section 3 of this guide (page 110).

Weighting of Mathematics Content Areas

CAPS suggests that the instructional time for Mathematics in Grade R should be 23 hours per week. However, CAPS does not provide a weighting or a breakdown for Grade R of the time that should be spent

XIYENGE XA 2

Matematiki eka Nongonoko wa Siku na Siku wa Giredi ya V

Manghenelo

Nongonoko wa *Grade R Maths* wu hluvukiseriwile ku tiyisa na ku seketela kharikhulamu ya Matematiki wa Giredi ya V. *Grade R Maths*:

- wu katsa na ku ndlandlamukisa vundzeni bya XIPHOKHAMA wa Matematiki wa Giredi ya V lebyi katsakanyiweke hi ntlhanu wa Swiyenge swa Vundzeni
- wu khutaza ku dyondza loku simekiweke eka vulavisisi hi ku ringanyeta tindlela ta ku ndlandlamukisa ku handza vutivi ka ntumbuluko ka vadyondzi ku valanga swivandla swa vona
- wu nyika migingiriko leyi yi khutazaka vadyondzi ku lavisisa na ku valanga minongoti ya matematiki
- wu khutaza vadyondzisi ku vulavula na vadyondzi hi mayelana na miehleketo ya vona na ku va pfuna ku paluxa mianakanyo ya vona
- wu ringanyeta vadyondzi ku kunguhata, ku xiya na ku hlengeleta vuxokoxoko, kutani endzhaku ka swona va fananisa, va ava, va ntlawahata na ku humesa nhlamuselo ya swikumiwa swa vona
- wu nyika timatheriyali na swipfuno leswi faneleke.

Swiyenge swa Vundzeni swa Matematiki

Matematiki wa le ka Xiyimo xa Masungulo (ku katsa na Giredi ya V) wu angarhela ntlhanu wa Swiyenge swa Vundzeni. Xiyenge xa Vundzeni xin'wana na xin'wana xi hoxa xandla eka mudyondzi loyi a hluvukisaka vutivi na swikili swa matematiki swo kongoma. Swiyenge swa Vundzeni hi leswi:

- Tinomboro, Tioparexini na Vuxaka
- Tipatironi, Tifankixini na Alijebura
- Ndhawu na Xivumbeko (Jometiri)
- Mpimo
- Matirhiselo ya Vuxokoxoko bya Tinhlayo

U nga kuma swo tala hi mayelana na Xiyenge xa Vundzeni eka XIPHOKHAMA na le ka Xiyenge xa 3 xa xiletelo lexi (pheji ya 111).

Ntikelo wa Swiyenge swa Vundzeni swa Matematiki

XIPHOKHAMA xi ringanyeta leswaku nkarhi wo dyondzisa Matematiki eka Giredi ya V wu fanele ku va 23 wa tiawara hi vhiki. Hambiswiritano, XIPHOKHAMA a xi nyiki ntikelo kumbe ntlhantlho wa Giredi ya V wa nkarhi lowu wu faneleke ku tirhisiwa eka Xiyenge xa Vundzeni xin'wana

on each Content Area for each term. The weighting of Mathematics Content Areas serves two primary purposes:

- It gives guidance on the amount of time needed to address the content within each Content Area adequately.
- It gives guidance on how much weighting to give to the different parts of the Grade R Mathematics curriculum during assessment.

The Grade R Maths programme suggests an approximate weighting of the Content Areas. This is based on the following:

- All Content Areas are equally important even though the same amount of time might not be spent on each one.
- Some Content Areas need more time for concept development, e.g. Numbers, Operations and Relationships, and Space and Shape (Geometry).

The Grade R Maths programme focuses on a specific Content Area each week whilst ensuring consolidation and integration of new knowledge. The *Activity Guide* for each term organises the content and number of weeks around this weighting to ensure that the CAPS Content Area topics and key conceptual development are covered. The table below shows the number of content focus weeks needed for each Content Area each term.

Table 1 Number of weeks per Content Area for each term

Weighting of Grade R Mathematics Content							
Content Area	**Topic**	**Term 1 weeks**	**Term 2 weeks**	**Term 3 weeks**	**Term 4 weeks**	**Total number of weeks per year**	**Total % of time**
Numbers, Operations and Relationships	Counting Number recognition Number sense (relationships) Problem solving Calculations	3	4	5	5	17	42,5
Patterns, Functions and Algebra	Identify, copy, extend and create own patterns	1	1	1	1	4	10
Space and Shape (Geometry)	Position, orientation and view 3-D objects and 2-D shapes Symmetry	4	3	2	2	11	27,5
Measurement	Time	1				4	10
	Length		1				
	Mass			1			
	Capacity/Volume				1		
Data Handling	Collecting, sorting, representing and analysing objects/information	1	1	1	1	4	10
Total weeks		10	10	10	10	40	100

na xin'wana eka kotara yin'wana na yin'wana. Ntikelo wa Swiyenge swa Vundzeni swa Matematiki wu tirha swikongomelokulu swimbirhi:

- Wu nyika ndzetelo hi mpimo wa nkarhi lowu lavekaka ku tirhana na vundzeni lebyi endzeni ka Xiyenge xa Vundzeni xin'wana na xinwana hi ku enela.
- Wu nyika ndzetelo hi mayelana na ntikelo lowu faneleke ku nyikiwa swiphemu swo hambanahambana swa kharikhulamu ya Matematiki wa Giredi ya V hi nkarhi wa makambelelo.

Nongonoko wa *Grade R Maths* wu ringanyeta ntikelo lowu kumbeteriwaka wa Swiyenge swa Vundzeni. Leswi swi ya hi leswi landzelaka:

- Swiyenge swa Vundzeni hinkwaswo i swa nkoka hi ku ringana hambiloko mpimo wa fana wa nkarhi wu nga ha tirhisiwa eka xin'wana na xinwana.
- Swiyenge swa Vundzeni swin'wana swi lava nkarhi wo tala eka nhluvukiso wa minongoti, xik. Tinomboro, Tioparexini na Vuxaka, na Ndhawu na Xivumbeko (Jometiri).

Nongonoko wa *Grade R Maths* wu kongomisa eka Xiyenge xa Vundzeni xo kongoma vhiki rin'wana na rin'wana loko ku ri karhi ku voniwa leswaku ku na ku tiyisisiwa na ku pfanganisiwa ka vutivi byintshwa. *Xiletelo xa Migingiriko* xa kotara yin'wana na yin'wana xi lulamisa vundzeni na nhlayo ya mavhiki hi mayelana na ntikelo lowu ku tiyisisa leswaku tinhlokomhaka ta Xiyenge xa Vundzeni xa XIPHOKHAMA na nhluvukiso wa minongotikulu swa angarheliwa. Tafula leri nga laha hansi ri komba nhlayo ya mavhiki ya nkongomo wa vundzeni lama lavekaka eka Xiyenge xa Vundzeni xa kotara yin'wana na yin'wana.

Tafula ra 1 Nhlayo ya mavhiki hi Xiyenge xa Vundzeni xa kotara yin'wana na yin'wana

Ntikelo wa Vundzeni Matematiki wa Giredi ya V							
Xiyenge xa Vundzeni	**Nhlokomhaka**	**Mavhiki ya Kotara ya 1**	**Mavhiki ya Kotara ya 2**	**Mavhiki ya Kotara ya 3**	**Mavhiki ya Kotara ya 4**	**Ntsengo wa nhlayo ya mavhiki hi lembe**	**Ntsengo wa % ta nkarhi**
Tinomboro, Tioparexini na Vuxaka	Ku hlayela Ndzemuko wa nomboro Ntwisiso wa nomboro (vuxaka) Ku ololoxa swiphiqo swa tinhlayo Makhakhuletelo	3	4	5	5	17	42,5
Tipatironi, Tifankixini na Alijebura	Kombisa, kopa, ndlandlamuxa na ku hlamusela tipatironi ta wena	1	1	1	1	4	10
Ndhawu na Xivumbeko (Jometiri)	Xiyimo, ndzetelo na tlhelo Michumu ya 3-D na swivumbeko swa 2-D Ndzinganiso	4	3	2	2	11	27,5
Mipimo	Nkarhi	1				4	10
	Vulehi		1				
	Ntiko			1			
	Vundzeni/Vholumu				1		
Matirhiselo ya Vuxokoxoko bya Tinhlayo	Hlengeleta, ava ku ya hi swihlawulekisi, dirowa, hlaya na ku veketela vuxokoxoko bya tinhlayo hi michumu/vuxokoxoko	1	1	1	1	4	10
Ntsengo wa mavhiki		10	10	10	10	40	100

Maths and the Grade R daily programme

The daily programme

The Grade R daily programme is a timetable that has its own unique features. It is not the same as the timetables used in other grades in the school. It provides for the learners' developmental needs whilst addressing CAPS policy requirements.

The Grade R daily programme diagram (Figure 31) includes a breakdown of approximate time as a guide for teachers. These times need to be flexible in Grade R, but there should be:

- 4 hours and 36 minutes per day (or 23 hours per week) of learning and teaching contact time
- activities that cover three subjects: Home Language (10 hours per week), Mathematics (7 hours per week) and Life Skills (6 hours per week).

Each of the subjects has a daily focused session and is also integrated into other activities throughout the day. The daily programme in Figure 31 highlights focused maths time as well as opportunities for incidental maths learning. Maths learning takes place in:

- whole class sessions where learners interact as one large group with the teacher
- small group teacher-guided sessions where up to eight learners work with the teacher
- small group sessions where up to eight learners work independently on activities at tables (workstations)
- free choice sessions where learners choose for themselves what they would like to do from a selection of activities set out by the teacher (own choice).

Matematiki na nongonoko wa siku na siku wa Giredi ya V

Nongonoko wa siku na siku

Nongonoko wa siku na siku wa Giredi ya V i xikombamikarhi lexi xi nga na swihlawulekisi swa xona n'wini leswi fanaka swi ri swoxe. A wu fani na swikombamikarhi leswi tirhisiwa eka tigiredi tin'wana leti nga exikolweni. Wu nyika swilaveko swa nhluvuko wa vadyondzi loko ku ri karhi ku tirhaniwa na swilaveko swa pholisi ya XIPHOKHAMA.

Dayagiramu ya nongonoko wa siku na siku wa Giredi ya V (Xifaniso xa 31) xi katsa maavelo ya nkanhi lowu faneleke tanihi xiletelo xa vadyondzisi. Mikarhi leyi yi fanele ku cincacinceka eka Giredi ya V, kambe ku fanele ku va na:

- 4 wa tiawara na 36 wa timinete hi siku (kumbe 23 wa tiawara hi vhiki) swa nkarhi wo hlangana wa ku dyondza na ku dyondzisa
- migingiriko leyi angarhelaka tidyondzo tinharhu: Ririmi ra le Kaya (10 wa tiawara hi vhiki), Matematiki (7 wa tiawara hi vhiki) na Swikili swa Vutomi (6 wa tiawara hi vhiki).

Dyondzo yin'wana na yin'wana yi na nkarhi lowu kongomisaka wa siku na siku naswona yi tlhela yi katsiwa ka migingiriko yin'wana esikwini hinkwaro. Nongonoko wa siku na siku eka Xifaniso xa 31 wu komba nkarhi wa matematiki lowu kongomisaka xikan'we na swivandlanene swa ku dyondza matematiki ka xiwelo. Ku dyondza matematiki ku humelela eka:

- mikarhi ya tlilasi hinkwayo laha vadyondzi va hlanganaka tanihi ntlawa wun'we lowukulu na mudyondzisi
- mikarhi leyi leteriwaka hi mudyondzisi laha kufika eka nhungu wa vadyondzi va tirhaka na mudyondzisi
- mikarhi ya ntlawa lowutsongo laha kufika eka nhungu wa vadyondzi va tirhaka va ri voxe eka migingiriko ematafuleni (switichi swo tirhela)
- mikarhi yo tihlawulela laha vadyondzi va tihlawulelaka leswi va rhandzaka ku swi endla kusuka eka nhlawulo wa migingiriko leyi lulamisiweke hi mudyondzisi (nhlawulo wa vona vini).

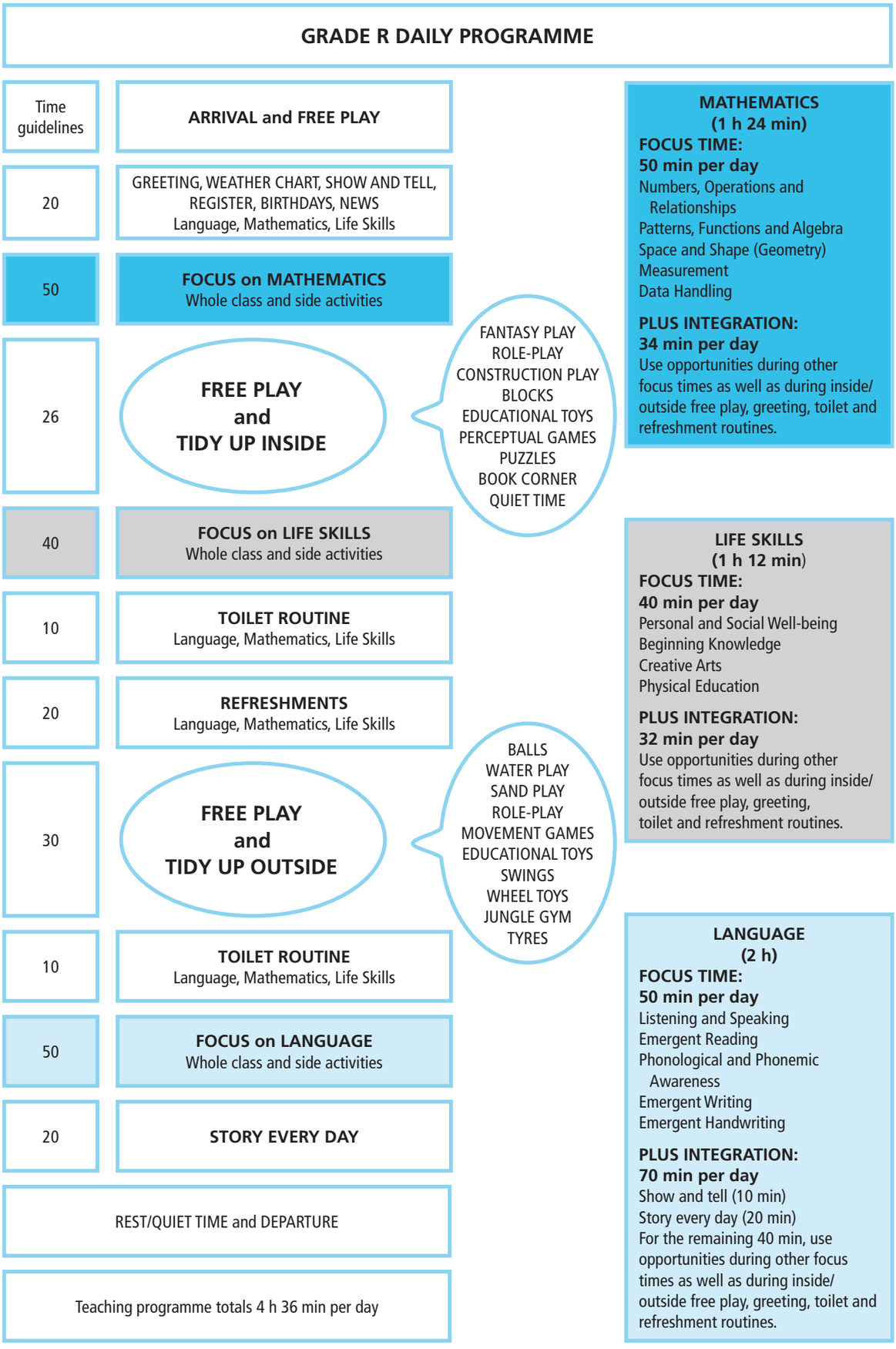


Figure 31 GDE exemplar Grade R Daily Programme

NONGONOKO WA SIKU NA SIKU WA GIREDI YA V

Swiletelo swa nkarhi	
	KU FIKA na KU TLANGA VA TSHUNXEKILE
20	KU XEWETA, CHATI YA TA MXELO, KOMBA KUTANI U BYELA, RHIJISITARA MASIKU YA KU VELEKIWA, MAHUNGU Ririmi, Matematiki, Swikili swa Vutomi
50	**NKONGOMO eka MATEMATIKI** Migingiriko ya tlilasi hinkwayo na ya le tlhelo
26	**KU TLANGA VA TSHUNXEKILE na KU BASISA ENDZENI**
40	**NKONGOMO eka SWIKILI SWA VUTOMI** Migingiriko ya tlilasi hinkwayo na ya le tlhelo
10	**NKARHI WA XIHAMBUKELO** Ririmi, Matematiki, Swikili swa Vutomi
20	**NKARHI WA SWAKUDYA** Ririmi, Matematiki, Swikili swa Vutomi
30	**KU TLANGA VA TSHUNXEKILE na KU BASISA EHANDLE**
10	**NKARHI WA XIHAMBUKELO** Ririmi, Matematiki, Swikili swa Vutomi
50	**NKONGOMO eka RIRIMI** Migingiriko ya tlilasi hinkwayo na ya le tlhelo
20	**XITORI MASIKU HINKWAWO**
NKARHI WO WISA/MIYELA na KU FAMBA	
Nongonoko wo dyondzisa wu na mitsengo ya 4 awr na 36 min	

NTLANGU WA MILORHO
KU ENCENYETA
NTLANGU WO AKA
TIBULOKO
SWITLANGISO SWA DYONDZO
MITLANGU YO VONA
SWIPHAZAMISO
KHONA YA TIBUKU
NKARHI WO MIYELA

TIBOLO
NTLANGU WA MATI
NTLANGU WA MISAVA
KU ENCENYETA
MITLANGU YA MFAMBAFAMBO
SWITLANGISO SWA DYONDZO
MIJOMBHE
SWITLANGISO SWA MAVHILWA
FUREME RO KHANDZIYIWA HI VANA ('MUJOMBE WA LE NHOVENI')
MATHAYERE

MATEMATIKI
(1 awr 24 min)
NKARHI WA NKONGOMO: 50 min hi siku
Tinomboro, Tioparexini na Vuxaka
Tipatironi, Tifankixini, Alijebura
Ndhawu na Xivumbeko (Jometiri)
Mpimo
Matirhiselo ya Vuxokoxoko bya Tinhlayo
KU KATSA NA MPFANGANISO: 34 min hi siku
Tirhisa swivandlanene hi mikarhi leyin'wana ya nkongomo xikan'we na hi mikarhi ya ku tlanga va tshunxekile va ri endzeni/ehandle, ku xeweta, ku ya exihambukelweni na hi nkarhi wa swakudya.

SWIKILI SWA VUTOMI
(1 awr 12 min)
NKARHI WA NKONGOMO: 40 min hi siku
Dyondzo ya swa Rihanyo
Vutivi bya Masungulo
Vutshila byo Tumbuluxa
Dyondzo ya swa Vutiolori
KU KATSA NA MPFANGANISO: 32 min hi siku
Tirhisa swivandlanene hi mikarhi leyin'wana ya nkongomo xikan'we na hi mikarhi ya ku tlanga va tshunxekile va ri endzeni/ehandle, ku xeweta, ku ya exihambukelweni na hi nkarhi wa swakudya.

RIRIMI
(2 awr)
NKARHI WA NKONGOMO: 50 min hi siku
Ku yingisela naku Vulavula
Ku Hlaya ko Sungula
Vulemukisi bya Mipfumawulo na Tifonimi
Ku Tsala ka Masungulo
Matsalelo ya Voko ya Masungulo
KU KATSA NA MPFANGANISO: 70 min hi siku
Komba kutani u byela (10 ra timinete)
Xitori masiku hinkwawo (20 wa timinete)
Eka 40 wa timinete leti nga sala, tirhisa swivandlanene hi mikarhi leyin'wana ya nkongomo xikan'we na hi mikarhi ya ku tlanga va tshunxekile va ri endzeni/ehandle, ku xeweta, ku ya exihambukelweni na hi nkarhi wa swakudya.

Xifaniso xa 31 Xikombiso xa Nongonoko wa Siku na Siku wa Giredi ya V wa GDE

Grade R Mathematics time allocation

The time allocated to Grade R Mathematics is seven hours per week and 1 hour 24 minutes (84 minutes) per day. Each day this time is made up of:

- 50 minutes of focused maths learning and teaching activities
- 34 minutes of integrated learning, structured activities and independent learner activities inside and outside the classroom.

Figure 32 shows a suggestion of how you could use the daily allocation of 1 hour 24 minutes.

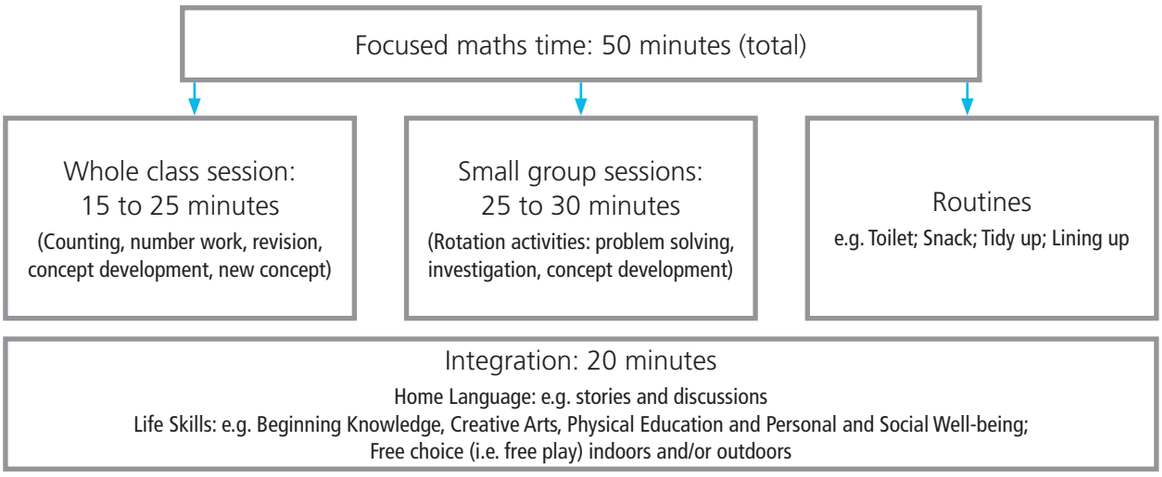


Figure 32 Suggested use of daily maths time

Figure 33 shows how each day's maths focus time is structured in Grade R Maths.

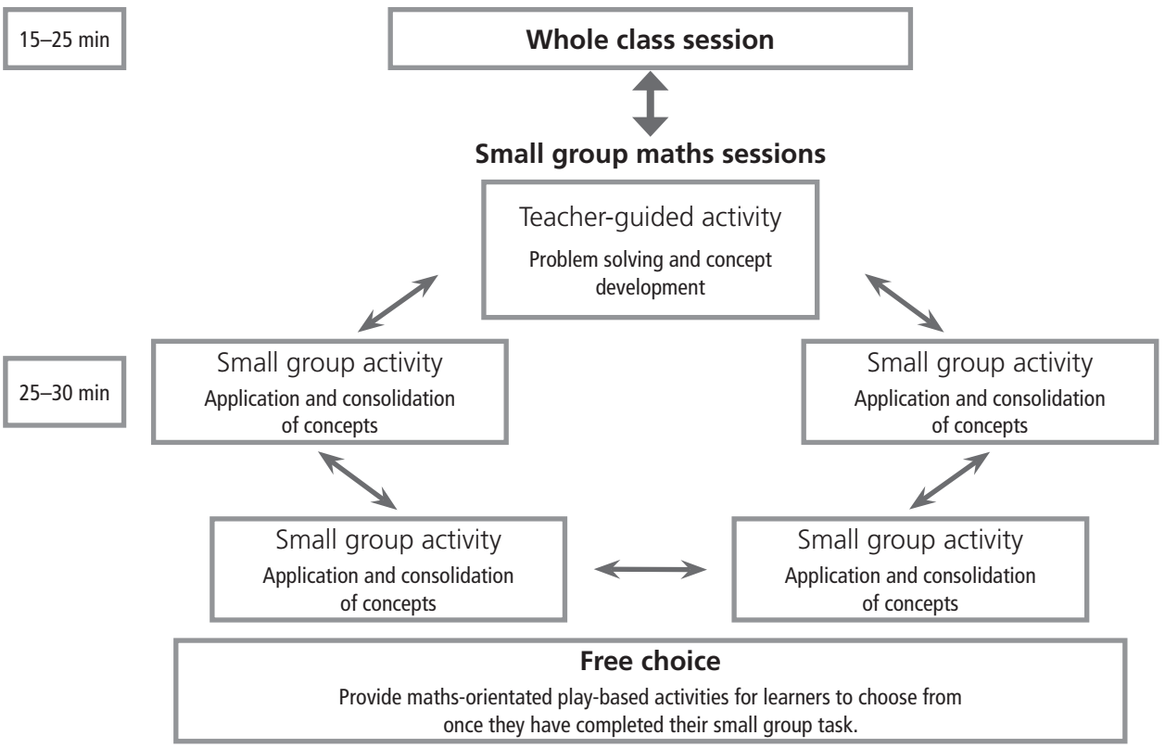


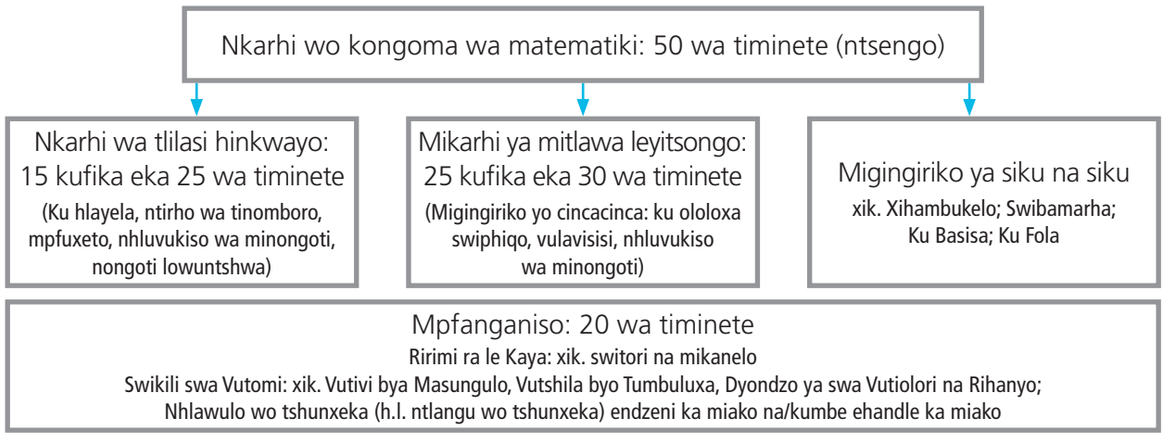
Figure 33 Daily maths focus time in Grade R Maths

Maavelelo ya nkarhi ya Matematiki wa Giredi ya V

Nkarhi lowu averiweke eka Matematiki wa Giredi ya V i nkombo wa tiawara hi vhiki na awara yi1 na 24 wa timinete (84 wa timinete) hi siku. Eka nkarhi lowu siku rin'wana na rin'wana ri vumbiwa hi:

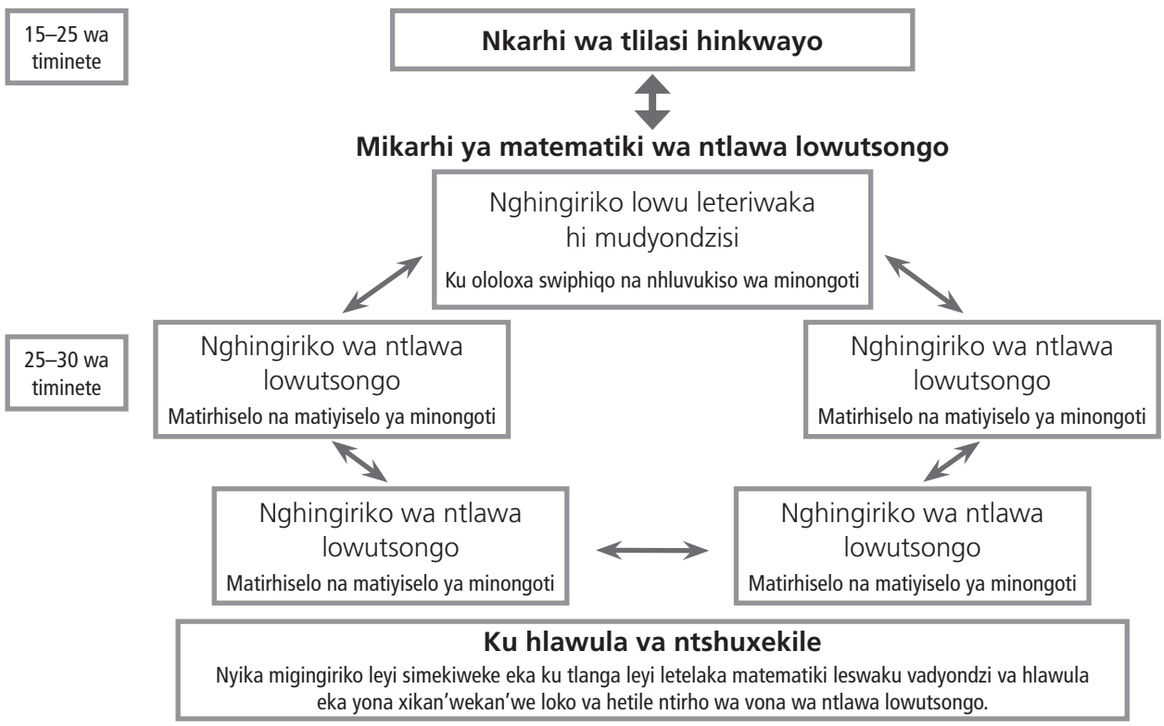
- 50 wa timinete ti kongomisiwa eka migingiriko ya ku dyondza na ku dyondzisa matematiki
- 34 wa timinete ta migingiriko leyi nga pfanganisiwa, xivumbeko na migingiriko yo ntshunxekeke ya mudyondzi endzeni na le handle ka kamara ro dyondzela.

Xifaniso xa 32 xi komba xiringanyeto xa hilaha u nga tirhisaka hakona maavelelo ya siku na siku ya awara yi1 na 24 wa timinete.



Xifaniso xa 32 Ndzinganyeto wa ntirhiso wa matematiki wa siku na siku

Xifaniso xa 33 xi komba hilaha nkarhi wa nkongomo wa matematiki wa siku rin'wana na rin'wana wu vumbiweke hakona eka *Grade R Maths*.



Xifaniso xa 33 Nkarhi wa nkongomo wa matematiki wa siku na siku eka *Grade R Maths*

Additional activities that can be offered to learners include:

- puzzle building
- playdough activities
- construction activities
- educational games
- book corner – 'reading'
- DBE workbooks and worksheets.

Once the focused maths session has been completed, all learners participate in tidying up and then transition to the next part of the daily programme.

How to organise your classroom for the daily maths session

Follow these guidelines to help you put the Grade R Maths programme into practice in your classroom every day.

The Grade R Mathematics focus time should be organised and planned for a combination of whole class and small group activities. Different-sized groups fulfil different teaching and learning goals. The choice of a large or smaller group will depend on the teaching or assessment activity that the teacher has planned. Managing a large class is challenging, especially if the teacher plans to focus on individual learners and includes learners with barriers to learning.

Whole class maths sessions

Whole class maths sessions are usually between 15 and 25 minutes long and all the learners sit in a circle together with the teacher.

The following maths activities can be done in whole class maths sessions:

- consolidating and practising previously taught concepts
- introducing a new concept
- extending the concept that is the main focus of the week
- oral/rote counting (rhymes, songs, sequencing numbers)
- mental maths (posing problems, memory games)
- giving instructions for the tasks to be done in the small group context whilst you are busy with the teacher-guided activity.

Migingiriko yo engetela leyi yi nga nyikiwaka vadyondzi yi katsa:

- ku akiwa ka swiphazamiso
- migingiriko ya vumba byo tlanga
- migingiriko yo aka
- mitlangu ya dyondzo
- khona ya tibuku – 'ku hlaya'
- Tibuku ta ntirho na maphepha yo tirhela swa Ndzawulo ya Dyondzo ya Masungulo (DBE).

Xikan'wekan'we loko nkarhi wa matematiki lowu kongomisaka wu herile vadyondzi hinkwavo va teka xiave eka ku basisa kutani endzhaku ka swona va cincela eka xiphemu lexi landzelaka xa nongonoko wa siku na siku.

Hilaha u nga lulamisaka hakona kamara ra wena ro dyondzela hi nkarhi wa matematiki wa siku na siku

Landzelela swiletelo ku ku pfuna ku tirhisa nongonoko wa *Grade R Maths* eka kamara ra wena ro dyondzela masiku hinkwawo.

Nkarhi wa nkongomo wa Matematiki wa Giredi ya V wu fanele ku lulamisiwa na ku kunguhatiwa eka nkatsaniso wa migingiriko ya tlilasi hinkwayo na ya ntlawa lowutsongo. Mitlawa leyi vumbiweke hi mitlawa leyitsongo ku fikelela swikongomelokulu swa ku dyondzisa na ku dyondza swo hambanahambana. Ku hlawuriwa ka ntlawa lowukulu swi ta lawuriwa hi nghingiriko lowu dyondzisiwaka kumbe wa makambelelo lowu mudyondzisi a wu kunguhateke. Ku lawula tlilasi leyikulu swa tlhontlha, ngopfungopfu loko mudyondzisi a kunguhata ku kongomisa eka vadyondzi hi un'weun'we kutani a katsa vadyondzi lava nga na swirhalanganyi swa ku dyondza.

Mikarhi ya matematiki wa tlilasi hinkwayo

Mikarhi ya matematiki wa tlilasi hinkwayo hakanyingi yi le xikarhi ka 15 na 25 wa timinete hi ku leha naswona vadyondzi hinkwavo va tshama hi xirhendzevutana swin'we na mudyondzisi.

Migingiriko ya matematiki leyi landzelaka yi nga endliwa eka mikarhi ya matematiki wa tlilasi hinkwayo:

- ku tiyisisa na ku titoloveta minongoti leyi dyondzisiweke nkarhi lowu nga hundza
- ku sungula nongoti lowuntshwa
- ku ndlandlamukisa nongoti lowu wu nga nkongomokulu wa vhiki
- nhlayelo wa nomu/wo bela enhlokweni (tirhayimi, tinsimu, ku longoloxela tinomboro)
- matematiki wa menthele (ku endla swiphiqo, mitlangu ya vutsundzuki)
- ku nyika swileriso swa mitirho leyi fanele ku endliwa eka mbangu wa ntlawa lowutsongo loko u ri eku endleni ka nghingiriko lowu leteriwaka hi mudyondzisi.

Figure 34 A whole class maths session

Small group maths sessions

In small group sessions, the class is divided into five groups of learners. Each day, one group works with the teacher (teacher-guided activity) while the other four groups work independently on maths activities that the teacher has planned.

The advantage of planning for small group teacher-guided and independent activities is that:

- Fewer resources are required for a small group than a whole class, for example, scissors, counters, blocks, etc.
- Every learner has an opportunity to handle the materials and resources.
- It encourages interpersonal skills, for example, sharing, taking turns, talking and listening.
- Learners take responsibility for group tasks, such as tidying up.
- The teacher can pitch instructions and questions at the level of the group.
- The teacher can observe each learner individually to ensure independent skills.

Using small groups gives teachers the opportunity to group learners with similar levels of skill and ability. In other words, the teacher is able to group learners according to the level of support they need in order to learn effectively.

Over the course of five days, the groups rotate to a different activity each day. This means that in a week all learners have the opportunity to complete the **teacher-guided focused activity** and four other small group activities (**a total of five different maths activities**). The four independent activities (or **side activities**) should be set out at four **workstations** around the classroom – either at the tables where the learners are seated or stand, or on the mat, or outside. The groups rotate over the course of a week, depending on how the teacher has planned the activities.

Xifaniso xa 34. Nkarhi wa matematiki wa tlilasi hinkwayo

Mikarhi ya matematiki wa ntlawa lowutsongo

Eka mikarhi ya ntlawa lowutsongo, tlilasi yi avanyisiwa hi ntlhanu wa mitlawa ya vadyondzi. Siku rin'wana na rin'wana, ntlawa wun'we wu tirha na mudyondzisi (nghingiriko lowu leteriwaka hi mudyondzisi) loko mitlawa leyin'wana ya mune yi tirha yi ri yoxe eka migingiriko ya matematiki leyi mudyondzisi a yi kunguhateke.

Ku pfuna ka nkunguhato eka migingiriko leyi leteriwaka hi mudyondzi ya ntlawa lowutsongo na leyi va nga voxe hi loku:

- Swipfuno swingariswingani swa laveka eka ntlawa lowutsongo kutlula eka tlilasi hinkwayo, tanihi xikombiso, swikero, swo hlayela, tibuloko, sw. na sw.
- Mudyondzi un'wana na un'wana u na nkarhi wa ku tirhana na timatheriyali na swipfuno leswi.
- Swi khutaza swikili swa ku tirhisana, tanihi xikombiso, ku avelana, ku cincana, ku vulavula na ku yingisela.
- Vadyondzi va byarha vutihlamuleri bya mitirho ya ntlawa, yo tanihi ku basisa.
- Mudyondzisi a nga tlakusa swileriso na swivutiso eka levhele ya ntlawa.
- Mudyondzisi a nga xiya mudyondzi un'wana na un'wana hi un'weun'we ku endlela leswaku a va na swikili swa yena a ri yexe.

Ku tirhisa mitlawa leyitsongo swi nyika mudyondzisi xivandlanene xa ku ntlawahata vadyondzi lava nga na tilevhele to fana ta swikili na vuswikoti. Hi marito man'wana, mudyondzisi u kota ku ntlawahata vadyondzi hi ku ya hi levhele ya nseketelo lowu va wu lavaka hi xikongomelo xa ku dyondza kahle.

Eku fambeni ka ntlhanu ka masiku, mitlawa leyi ya cincana ku ya eka nghingiriko wo hambana siku rin'wana na rin'wana. Leswi swi vula leswaku evhikini vadyondzi hinkwavo va va na nkarhi wa ku hetisa **nghingiriko lowu kongomisaka eka ku leteriwa hi mudyondzisi** na migingiriko leyin'wana ya mune ya mitlawa leyitsongo (**ntsengo wa ntlhanu wa migingiriko ya matematiki yo hambanahambana**). Mune wa migingiriko ya ku tirha va ri voxe (kumbe **migingiriko ya le tlhelo**) yi fanele ku lulamisiwa eka mune wa **switichi swo tirhela** hinkwako etlilasini – ku nga va ematafuleni laha vadyondzi va tshamaka kumbe va yimaka, kumbe ehenhla ka mete, kumbe ehandle. Mitlawa ya cincana eku fambeni ka vhiki, swi ri karhi swi lawuriwa hi hilaha mudyondzisi a kunguhateke migingiriko hakona.

In practice ...

Ways of grouping learners for maths

The continuous observation of learners during outdoor and indoor activities will give teachers insight into the learners' abilities and interests. These insights will help you divide learners into different groups. The groups could be based on ability or could be determined by the learners' competence in a new skill.

- Ability groups: In these groups, learners are on a similar developmental level. Sometimes it is easier to teach new maths concepts using ability groups as some learners will need more time to complete a task, while others will need more challenging tasks. At times you may want learners with barriers to work with you to consolidate concepts, such as one-to-one correspondence and counting collections, or you might want to extend more advanced learners by giving them challenging maths problems.
- Mixed-ability groups: In these groups, learners have different levels of skill and understanding of a concept. These kinds of groups work well for construction, measurement, patterning and sorting activities, and games.

Whichever way you choose to group the learners, the groups should not remain the same over an extended time and each group should have their own symbol (picture or shape) and name.

Teacher-guided small group activities

In the teacher-guided activity, the teacher works with one group of learners while the other groups are busy completing the planned activities at one of the other four workstations.

The following activities are best suited to the teacher-guided small group context:

- consolidating and practising previously taught concepts
- deepening an understanding of a new concept.

In practice ...

Tips for teacher-guided small group maths activities

- Complete activities that focus on the Grade R Mathematics concept planned for that week.
- Work with the learners on the floor or at a table.
- Make the session interactive, with both you and the learners joining in.
- The focus should be on working orally and practically with the learners.

Eka maendlelo ...

Tindlela ta ku ntlawahata vadyondzi va matematiki

Nxiyaxiyo lowu yaka emahlweni wa vadyondzi hi nkarhi wa migingiriko ya le handle na ya le ndzeni ka muako wu ta nyika vadyondzisi ntwisiso wa vuswikoti na mitsakelo ya vadyondzi. Mitwisiso leyi yi ta ku pfuna ku avanyisa vadyondzi ku ya hi mitlawa yo hambana. Mitlawa leyi yi nga simekiwa eka vuswikoti kumbe yi nga kumisisiwa hi vuswikoti bya vadyondzi eka xikili xintshwa.

- Mitlawa ya vuswikoti: Eka mitlawa leyi, vadyondzi va le ka levhele ya nhluvukiso yo fana. Mikarhi yin'wana swa olova swinene ku dyondzisa minongoti ya matematiki leyintshwa hi ku tirhisa mitlawa ya vuswikoti tanihileswi vadyondzi van'wana va lavaka nkarhi wo tala ku hetisa ntirho loko van'wana va lava mitirho yo tlhontlha yo tala. Hi mikarhi yin'wana u nga ha lava vadyondzi lava nga na swirhalanganyi ku tirha na wena ku tiyisa minongoti yo tanihi ku yelana ka xin'we-eka-xin'we na ku hlayela mihlengelo, kumbe u nga lava ku ndlandlamukisa vadyondzi lava hluvukeke swinene hi ku va nyika swiphiqo swa matematiki swo tlhontlha.
- Mitlawa ya vuswikoti leyi pfanganisiweke: Eka mitlawa leyi, vadyondzi va na tilevhele to hambanahambana ta swikili na ntwisiso wa nongoti. Tinxaka leta mitlawa ti ta tirha kahle eka migingiriko yo aka, yo pima, yo endla tipatironi na yo ava, na mitlangu.

Ndlela yihi kumbe yihi leyi u yi hlawulaka ku ntlawahata vadyondzi, mitlawa leyi yi nga tshami yi ri karhi yi fana eka nkarhi lowu engeteriweke naswona ntlawa wun'wana na wun'wana wu fanele ku va na mfungho wa wona n'wini (xifaniso kumbe xivumbeko) na vito.

Migingiriko ya ntlawa lowutsongo leyi leteriwaka hi mudyondzisi

Eka nghingiriko lowu leteriwaka hi mudyondzisi, mudyondzisi u tirha na ntlawa wun'we wa vadyondzi loko mitlawa leyin'wana yi ri karhi yi hetisa migingiriko leyi kunguhatiweke eka xin'we xa mune wa switichi swo tirhela.

Migingiriko leyi landzelaka yi ringanela kahle mbangu wa ntlawa lowutsongo lowu leteriwaka hi mudyondzisi:

- ku tiyisisa na ku titoloveta minongoti leyi dyondzisiweke nkarhi lowu nga hundza
- ku entisa ntwisiso wa nongoti lowuntshwa.

Eka maendlelo ...

Switsundzuxo swa migingiriko ya matematiki wa ntlawa lowutsongo lowu leteriwaka hi mudyondzisi

- Hetisa migingiriko leyi kongomisaka eka nongoti wa Matematiki wa Giredi ya V lowu kunguhateriweke vhiki rero.
- Tirha na vadyondzi ehansi kumbe etafuleni.
- Endla nkarhi lowu ku n'wangulaniwa, laha wena na vadyondzi havumbirhi mi tikatsaka.
- Nkongomo wu fanele ku va eka ku tirha hi swanomu na ku hi ku endla na vadyondzi.

Figure 35 Matching counters and number cards

Small group activities

The following activities are best suited to the small group context where learners work independently of the teacher:

- consolidating and practising previously taught concepts
- investigating the new concept that is the main focus of the week
- practising the concept that is the main focus of the week.

In practice ...

Tips for planning and managing independent small group maths activities

- Learners with a range of different abilities must be able to complete the activities.
- The activities must be meaningful for learners.
- The activities must be clear and simple enough to be completed without learners having to ask the teacher for help.
- If learners are working slowly, explore the reasons. Change or adapt the activity if necessary.
- Learners need to be responsible for completing their activities and should not need to disturb the teacher who will be busy with the teacher-guided activity.
- Teach the learners simple rules for what to do and how to behave during small group activities: how to tidy/pack up their work when done; how to behave in the transition activities. Repeat the rules daily until the learners know and can follow them automatically. This takes time! Be consistent. Gently correct learners if they challenge the rules.

Free choice activities

Additional activities should be provided for those learners who complete their individual small group activity before the end of the maths session. These activities should serve as reinforcement of the maths content you

Xifaniso xa 35 Ku pananisa swo hlayela na makhadi ya tinomboro

Migingiriko ya ntlawa lowutsongo

Migingiriko leyi landzelaka yi ringanela kahle swinene mbangu wa ntlawa lowutsongo laha vadyondzi va tirhaka va ri voxe va nga ri na mudyondzisi ku:

- tiyisisa na ku titoloveta minongoti leyi dyondzisiweke nkarhi lowu nga hundza
- lavisisa nongoti lowuntshwa lowu wu nga nkongomokulu wa vhiki
- titoloveta nongoti lowu wu nga nkongomokulu wa vhiki.

Eka maendlelo ...

Switsundzuxo swa ku kunguhata na ku lawula migingiriko ya matematiki ya ntlawa lowutsongo leyi vana va tirhaka va ri voxe

- Vadyondzi lava nga na vuswikoti byo hambanahambana va fanele ku kota ku hetisa migingiriko leyi.
- Migingiriko yi boheka ku va na nkoka eka vadyondzi.
- Migingiriko leyi yi boheka ku va erivaleni na ku olova ku ringanela ku hetisiwa handle ka ku va vadyondzi va kombela mudyondzisi ku va pfuna.
- Loko vadyondzi va tirha hi ku nonoka, lavisisa swivangelo. Cinca kumbe u fambelanisa nghingiriko lowu loko swi fanela.
- Vadyondzi va fanele ku va na vutihlamuleri bya ku hetisa migingiriko ya vona naswona a va fanelangi ku kanganyisa mudyondzisi loyi a nga eku tirhaneni na nghingiriko lowu leteriwaka hi mudyondzisi.
- Dyondzisa vadyondzisi milawu yo olova ya leswi va faneleke ku swi endla na hilaha va faneleke ku tikhoma hakona hi nkarhi wa migingiriko ya ntlawa lowutsongo: hilaha ku basisiwaka/pakiwaka hakona ntirho wa vona loko va hetile; hilaha ku tikhomiwaka hakona eka migingiriko yo cinca. Vuyelela milawu leyi siku na siku kufikela loko vadyondzi va yi tiva na ku yi landzelela xikan'wekan'we. Leswi swi teka nkarhi! Swi endli ku fana. Lulamisa vadyondzi hi malwandla loko va kaneta milawu leyi.

Migingiriko yo hlawula va tshunxekile

Migingiriko yo engetela yi fanele ku lulamiseriwa vadyondzi lavaya va hetaka nghingiriko wa vona wa ntlawa lowutsongo hi wun'wewun'we ku nga si hela nkarhi wa matematiki. Migingiriko leyi yi fanele ku tirha tanihi xitiyisiso xa vundzeni bya matematiki lebyi u byi dyondziseke. Vadyondzi va fanele ku hlawula nghingiriko kusuka eka liya yi lulamisiweke hi mudyondzisi. Migingiriko leyi yi fanele ku va na nkongomo wa matematiki,

have taught. Learners should choose an activity from those set out by the teacher. These activities should have a maths focus, for example, a puzzle, stacking blocks, drawing, colouring, moulding, sorting shapes or role-play.

Moving between activities (transitions)

A transition is the time when learners move from one activity to another. For example, after the maths whole class session is over, the classroom needs to be tidied and prepared for the next session. Transition times should be used to practise Mathematics, Home Language and Life Skills, e.g. oral counting, clapping patterns.

Teachers who plan and manage transitions are more likely to have calm, organised classrooms with happy, cooperative and stress-free learners.

In practice ...

Tips for emphasising maths during transitions

- Give the learners enough warning before they need to change activities, e.g. 'In two minutes we are going to complete the session.'
- Give clear instructions, e.g. 'First pack away what you are doing and then line up quietly at the door/sit in a ring.'
- Use 'attention grabbers', such as counting the number of claps, number songs and rhymes, and number signals (counting down/up).

Planning and preparing maths lessons

There are approximately 40 weeks in the year. You will need to plan and prepare thoroughly for each week.

In the week before the lesson

- Read the relevant sections of the *Concept Guide* and *Activity Guide*. These explain the content and concepts that will be taught, and give suggestions for appropriate activities and discussions.
- Plan and prepare the activities in the week before they will be taught.
- Identify the focus of assessment. (You can find more information on assessment on page 98.)
- Prepare the resources and organise the classroom for the week.
- Some resources need to be collected well in advance, e.g. egg boxes, toilet roll inners, yoghurt cups, milk bottles or objects for sorting.

During the week

- Focus on understanding the maths concept being taught that week.
- Read the relevant section in the *Concept Guide*.
- Each day, check that you have the resources needed for the following day's activities.
- Familiarise yourself with the activities well in advance. Teachers should never prepare while learners are sitting and waiting for an activity to begin.

tanihi xikombiso, xiphazamiso, ku tlhandlekela tibuloko, ku dirowa, ku hlovohata, ku vumba, ku va swivumbeko kumbe ku encenyeta.

Ku rhurha exikarhi ka migingiriko (micinco)

Ncinco i nkarhi lowu vadyondzi va rhurhaka kusuka eka nghingiriko wun'we kuya eka wun'wana. Tanihi xikombiso, endzhaku ka loko nkarhi wa tlilasi wa matematiki wu herile kamara ro dyondzela ri fanele ku basisiwa na ku lulamiseriwa nkarhi lowu landzelanaka. Mikarhi yo cinca yi fanele ku tirhisiwa ka titoloveta Matematiki, Ririmi ra le Kaya na Swikili swa Vutomi, xik. nhlayelo wa swa nomu, tipatironi to phokotela.

Vadyondzi lava va kunguhataka na ku lawula micinco va tala ku va va horile, va va na tikamara to dyondzela leti lulamiseriweke no va na ntsako, vadyondzi lava nga na ntirhisano na ku va hava mabibi.

Eka maendlelo ...

Switsundzuxo swa ku tshikelela matematiki hi nkarhi wa micinco

- Nyika vadyondzi xilemukiso xo ringanela va nga si cinca migingiriko, xik. 'Hi timinete timbirhi hi ta fika emakumu ka nkarhi.'
- Nyika swileriso leswi nga erivaleni, xik. 'Rhangani mi paka leswi mi nga eku swi endleni endzaku ka swona mi fola layini mi miyerile enyangweni/mi tshama hi xirhendzevutana.'
- Tirhisa 'swikokamiehleketo' swo tanihi ku hlayela nhlayo ya miphokotelo, tinsimu ta tinomboro na tirhayimi, na mifungho ya tinomboro (ku hlayela u ya ehenhla/ehansi).

Ku kunguhata na ku lulamisa tidyondzotsongo ta matematiki

Ku na kwalomu ka 40 wa mavhiki elembeni. U ta fanela ku kunguhata na ku lulamisa kahle eka vhiki rin'wana na rin'wana.

Eka vhiki leri rhangelaka dyondzotsongo

- Hlaya swiyenge leswi fambelanaka swa *Xiletelo xa Minongoti* na *Xiletelo xa Migingiriko*. Leswi swi hlamusela vundzeni na minongoti leyi yi nga ta dyondzisiwa, na ku nyika swiringanyeto swa migingiriko leyi faneleke na mikanelo.
- Kunguhata na ku lulamisa migingiriko evhikini leri rhangelaka leri yi nga ta dyondzisiwa harona.
- Kuma nkongomo wa makambelelo. (U nga kuma vuxokoxoko byo tala hi makambelelo eka pheji ya 99.)
- Lulamisa swipfuno na ku lulamisa kamara ro dyondzela swa vhiki.
- Swipfuno swin'wana swi lava ku hlengeletiwa ka ha ri na nkarhi, xik. mabokisi ya mandza, swa le ndzeni ka maphepha ya xihambukelo, tikhapi ta yogati, mabodhlela ya masi kumbe michumu yo aviwa.

Evhikini

- Kongomisa eka ntwisiso wa minongoti ya matematiki leyi yi nga eku dyondzisiweni vhiki rero.
- Hlaya xiyenge lexi faneleke eka *Xiletelo xa Minongoti*.
- Siku rin'wana na rin'wana, kambisisa leswaku u na swipfuno leswi lavekaka swa migingiriko ya siku leri landzelaka.
- Titoloveti swinene hi migingiriko leyi ka ha ri na nkarhi. Vadyondzisi a va fanelangi ku lulamisa loko vadyondzi va tshamile va rindzerile nghingiriko wo karhi ku sungula.

The Grade R Maths programme resources

The Grade R Maths programme has four components.

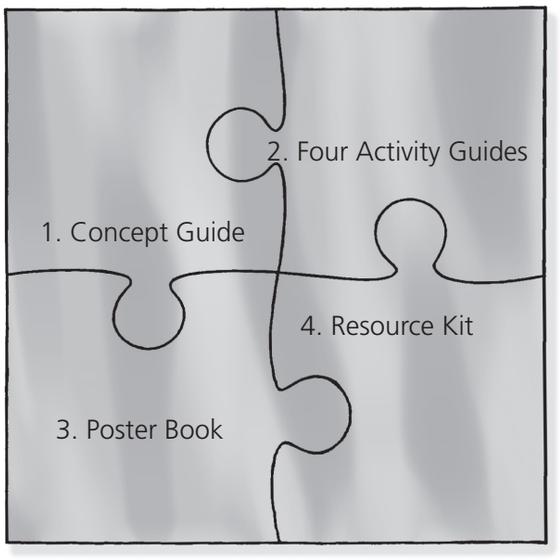


Figure 36 The components of the Grade R Maths programme

Concept Guide (this book)

This book provides:

- the principles behind the Grade R Maths programme for teaching maths to young learners
- guidance on how to organise your classroom for effective teaching and learning
- suggestions on how to teach maths in Grade R
- an outline of the maths content to be taught in the Grade R Maths programme
- guidelines on using Grade R Maths
- a glossary.

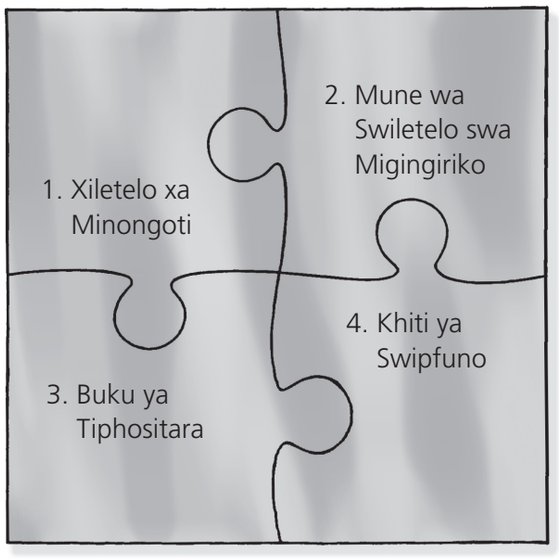
Activity Guides

There are four *Activity Guides* – one for each school term. Each *Activity Guide* includes:

- an overview of what will be covered in the term
- a maths concept area topic to be focused on in each week
- suggested activities for each week: whole class, and independent and teacher-guided small group activities
- teaching tips for planning and organising maths activities
- maths vocabulary that is learnt through the activities each week
- information on the resources that will be needed for the week
- resources, such as rhymes, songs, stories and templates.

Swipfuno swa nongonoko wa *Grade R Maths*

Nongonoko wa *Grade R Maths* wu na swiphemutsongo swa mune.



Xifaniso xa 36 Swiphemutsongo swa nongonoko wa *Grade R Maths*

Xiletelo xa Minongoti (buku leyi)

Buku leyi yi nyika:

- milawu leyi seketelaka nongonoko wa *Grade R Maths* eka ku dyondzisa vana lavatsongo matematiki
- ndzetelo hi hilaha u nga lulamisaka kamara ra wena ro dyondzela leswaku ku va na ku dyondzisa na ku dyondza ka kahle
- swiringanyeto hilaha u nga dyondzisaka matematiki hakona eka Giredi ya V
- nhlamuselo ya vundzeni bya matematiki lebyi faneleke ku dyondzisiwa eka nongonoko wa *Grade R Maths*
- swiletelo hi ku tirhisa *Grade R Maths*
- dlilosari.

Swiletelo swa Migingiriko

Ku na mune wa *Swiletelo swa Migingiriko* – xin'we eka kotara ya xikolo yin'wana na yin'wana. *Xiletelo xa Migingiriko* xin'wana na xin'wana xi katsa:

- nkatsakanyo wa leswi swi nga ta angarheliwa eka kotara
- nhlokomhaka ya xiyenge xa vundzeni bya matematiki ku kongomisiwa eka swona eka vhiki rin'wana na rin'wana
- migingiriko leyi nga ringanyetiwa eka vhiki rin'wana na rin'wana: tlilasi hinkwayo, na migingiriko ya ntlawa lowutsongo leyi va tirhaka va ri voxe na leyi leteriwaka hi mudyondzisi
- switsundzuxo swa ku kunguhata na ku lulamisa migingiriko ya matematiki
- ntivoririmi wa matematiki lowu wu dyondziwaka hi ku tirhisa migingiriko vhiki rin'wana na rin'wana
- vuxokoxoko hi swipfuno leswi swi nga ta laveka eka vhiki rin'wana na rin'wana
- swipfuno swo tanihi tirhayimi, tinsimu, switori na tithempuleti.

Poster Book

The *Poster Book* is a big book containing eleven posters. The posters are meant for use in whole class activities and small group teacher-guided activities. They help to link maths to everyday life and can be used in different ways, e.g. for counting, discussing position and direction, time (sequencing events) and problem solving.

Resource Kit

The *Resource Kit* contains essential teaching and learning materials that will be used regularly as part of the teacher-guided activities. The kit provides enough apparatus for a small group of six to eight learners. Each kit has the following as shown in Figure 4 on page 12:

- counting materials, e.g. coloured discs and sticks, fruit and animal counters, and Unifix blocks
- jumbo dice
- strings of ten structure beads
- number cards: number symbols (0–10) and number words (zero–ten)
- attribute blocks
- dot cards.

Other resources

- CAPS policy documents
- DBE workbook and other resources

Additional resources (not supplied) that are needed for Grade R Maths activities include:

- 'pizza box'
- a height chart
- jumbo playing cards
- dice: with numbers and shapes
- pretend-money: coins and notes
- a calendar for the current year
- a large analogue wall clock
- a balance scale
- puppets
- pattern blocks (attribute blocks) and cards
- pegboard and pegs
- beanbags
- large and small balls
- beads for counting, sorting, threading and patterning (and laces)
- building blocks and boards
- Lego: different sizes and shapes
- construction toys
- puzzles: 8, 12, 20, 36 and 48 pieces
- modelling clay/playdough
- cookie cutters

Buku ya Tiphositara

Buku ya Tiphositara i buku leyikulu leyi yi nga na khumen'we wa tiphositara. Tiphositara ti endleriwe ku tirhisiwa eka migingiriko ya tlilasi hinkwayo na le ka migingiriko ya ntlawa lowutsongo leyi leteriwaka hi mudyondzisi. Ti pfuna ku fambelanisa matematiki eka vutomi bya masiku hinkwawo naswona ti nga tirhisiwa hi tindlela to hambanahambana, xik. eka ku hlayela, ku kanela xiyimo na tlhelo, nkarhi (ku longoloxa swiendleko) na ku ololoxa swiphiqo.

Khiti ya Swipfuno

Khiti ya Swipfuno yi na timatheriyali to dyondzisa na ku dyondza leti lavekaka swonghasi leti ti nga ta tirhisiwa nkarhi na nkarhi tanihi xiphemu xa migingiriko leyi leteriwaka hi mudyondzisi. Khiti leyi yi nyika switirhisiwa swo enela swa ntlawa lowutsongo swa tsevu kufika eka nhungu wa vadyondzi. Khiti yin'wana na yin'wana yi na leswi landzelaka tanihilaha swi kombiweke hakona eka Xifaniso xa 4 lexi nga eka pheji ya 13:

- timatheriyali to hlayela, xik. tidisiki leti hlovohatiweke na swimhandzana, mihandzu na swo hlayela swa swiharhi, na tibuloko ta Unifix
- dayizi ra jumbo
- tinjara ta khume ta vuhlalu bya xivumbeko
- makhadi ya tinomboro: mifungho ya tinomboro (0–10) na tinomboro marito (ziro–khume)
- tibuloko ta swihlawulekisi
- makhadi ya mathonsi.

Swipfuno swin'wana

- Matsalwa ma pholisi ya XIPHOKHAMA
- Buku ya mitirho ya Ndzawulo ya Dyondzo ya Masungulo (DBE) na swipfuno swin'wana

Swipfuno swo engetela (leswi nga phakeriwangiki) leswi swi lavekaka eka migingiriko ya *Grade R Maths* swi katsa:

- 'bokisi ra pizza'
- chati ya vulehelahenhla ('chati ya vulehi')
- makhadi yo tlanga ya jumbo
- dayizi: leri nga na tinomboro na swivumbeko
- maliencenyeto: swingwece na timali ta phepha
- khalendara ya lembe reri
- wachi ya le khumbini leyikulu ya analogo
- xikalo xa ndzinganiso
- tipopayi
- tibuloko ta tipatironi (tibuloko ta swihlawulekisi) na makhadi
- bodo ya swihaki na swihakiwa
- mikwama yo fotomela
- tibolo letikulu na letitsongo
- vuhlalu byo hlayela, ku ava, ku hulela na ku endla tipatironi (na tintambhu)
- tibuloko to aka na tibodo
- Lego: tisayizi na swivumbeko swo hambanahambana
- switlangiso swo aka
- swiphazamiso: 8, 12, 20, 36 na 48 wa swiphemu
- vumba byo fanisa/vumba byo tlangisa
- switsemakhekhe

- cardboard boxes of different shapes and sizes
- a variety of plastic bottles and containers for describing and comparing capacity
- mathematical games: Lotto, Ludo, snakes and ladders, jigsaw puzzles, dominoes (to include colour, shape, numbers, sequencing, matching, classification and memory games)
- sand and water play equipment
- stacking cups of different sizes
- apparatus for climbing, balancing, swinging and skipping
- a play shop with items to be bought with pretend money
- counters for sorting
- storage boxes: 40 litre, 5 litre and 2 litre.

Assessment in Grade R

In Grade R, assessment is a continuous, planned process of gathering, analysing and interpreting information about each learner. It should be mainly **formative** and informal. In other words, the information gathered about the learners' progress during assessment should help you to plan and/or adapt learning activities. In Grade R, assessment is used to make decisions about the best way to support each learner's development.

GLOSSARY

formative assessment
assessment that provides information while learning is taking place and measures learners' progress

Assessment is the link between CAPS subject content, and teaching and learning activities. You cannot assess what you have not taught. The purpose of assessment is to:

- establish the level of each learner
- guide planning and inform teaching
- encourage each learner's developmental progression
- help generate useful reports on learner's achievements.

In practice ...

Assessment tips

- Assessment should never make learners feel anxious or scared.
- Assessment activities should be appropriate and suited to each learner's attention span.
- While you are busy observing a small group of six to eight learners in the focused teacher-guided activity, the other learners should be busy working independently on activities in their small groups at different workstations.
- Work with one small group of six to eight learners each day on a specific activity (depending on the number of learners in the class). While the learners are engaged in the activity, carefully observe each learner in the small group and ask questions to gain insight into their thinking.
- Information about what learners know and can do (or 'evidence') should be collected continuously (daily) over time.
- Information about what you have observed should be recorded at the end of the day, after teaching time.

- mabokisi ya khadibodo ya swivumbeko na tisayizi to hambanahambana
- mabodhlela ya pulasitiki na tikhontheni to hambanahambana to hlamusela na ku fananisa vundzeni
- mitlangu ya matematiki: Lotto, Ludo, tinyoka na malerha, swiphazamiso swa jigiso, tidomino (ku katsa muhlovo, xivumbeko, tinomboro, ku longoloxa, ku pananisa, ku ntlawahata na mitlangu ya vutsundzuki)
- misava na switirhisiwa swa ku tlanga swa mati
- tikhapi to tlhandlekela ta tisayizi to hambanahambana
- switirhisiwa ku khandziya, ku ringanisa, ku jombha na ku thamuka
- vhengele ra ku tlanga leri nga na michumu leyi faneleke ku xaviwa hi mali yo encenyeta
- swo hlayela ku ava ku ya hi swihlawulekisi
- mabokisi yo hlayisela: 40 wa tilitara, 5 wa tilitara na 2 wa tilitara.

Makambelelo eka Giredi ya V

Eka Giredi ya V, makambelelo i endlelo leri yaka emahlweni, leri kunguhatiweke hi ku hlengeleta, ku xopaxopa na ku humesa nhlamuselo eka vuxokoxoko hi mayelana na mudyondzi un'wana na un'wana. Ma fanele ya va ngopfungopfu **makambelelo yo aka** na ku va ya nkamafundza. Hi marito man'wana, vuxokoxoko lebyi hlengeletiwaka hi mayelana na ku ya emahlweni ka vadyondzi hi nkarhi wa makambelelo byi fanele ku ku pfuna ku kunguhata na/kumbe ku fambelanisa migingiriko ya ku dyondza. Eka Giredi ya V, makambelelo ya tirhisiwa ku teka swiboho hi mayelana na ndlela ya kahle swinene ku seketela nhluvukiso wa mudyondzi un'wana na un'wana.

Makambelelo i mfambelaniso exikarhi ka vundzeni bya dyondzo ya XIPHOKHAMA, migingiriko ya ku dyondzisa na ku dyondza. U nge kambeli leswi u nga swi dyondzisangiki. Xikongomelo xa ku kambela i ku:

- tumbuluxa levhele ya mudyondzi un'wana na un'wana
- letela nkunguhato na ku nyika vuxokoxoko bya madyondziselo
- khutaza ku ya emahlweni ka nhluvukiso wa mudyondzi
- pfuna ku endla tirhipoto to pfuna hi vuswikoti bya vadyondzi.

DLILOSARI

makambelelo yo aka
makambelelo lama ma nyikaka vuxokoxoko loko ku dyondza swi ri eku endlekeni naswona swi pima ku ya emahlweni ka matirhelo ya vadyondzi

Eka maendlelo ...

Switsundzuxo swa makambelelo

- Makambelelo ya nga pfuki ya endlile vadyondzi va titwa va tshukile kumbe va chava.
- Migingiriko ya makambelelo yi fanele ku va leyi fambelanaka na ku ringanela vunavi bya nkongomiso wa miehleketo bya mudyondzi.
- Loko wa ha ri eku xiyaxiyeni ka ntlawa lowutsongo wa tsevu kufika eka nhungu wa vadyondzi eka nghingiriko lowu leteriwaka hi mudyondzisi lowu kongomisaka, vadyondzi lavan'wana va fanele va ri eku tirheni ka migingiriko va ri voxe eka mitlawa ya vona leyitsongo eka switichi swo tirhela swo hambanahambana.
- Tirha na ntlawa lowutsongo wun'we wa tsevu kufika eka nhungu wa vadyondzi siku rin'wana na rin'wana hi nghingiriko wo kongoma (swi ri karhi swi lawuriwa hi nhlayo ya vadyondzi lava nga etlilasini). Loko vadyondzi va ha ri eku tirhaneni na nghingiriko, xiyaxiya hi vukheta mudyondzi un'wana na un'wana loyi a nga eka ntlawa lowutsongo kutani u vutisa swivutiso ku kuma ntwisiso wa maehleketelelo ya vona.
- Vuxokoxoko hi mayelana na leswi vadyondzi va swi tivaka kumbe va nga swo endlaka (kumbe 'vumbhoni') byi fanele ku hlengeletiwa hi ndlela leyi yaka emahlweni (siku na siku) ku ringana nkarhi wo leha.
- Vuxokoxoko hi mayelana na leswi u swi xiyaxiyeke byi fanele ku rhekodiwa emakumu ka siku, endzhaku ka nkarhi wo dyondzisa.

It is best to use many different ways of assessing learners. Here are some examples.

- Observe learners during whole class, teacher-guided small group activities and free play inside and outside the classroom.
- Record learners' understanding of specific maths concepts during and after teacher-guided activities.
- Questions and conversations with individual learners or small groups of learners can help you understand the level and depth of learners' thinking and reasoning.
- Look carefully at the things that learners do and record (using pictures, drawings, objects and/or 'writing'). These show you what the learners understand and have achieved.
- Listening to and recording learners' responses (practical, oral, written) allows you to do continuous assessment.

You need to continually assess all learners':

- maths knowledge
- maths understanding
- maths skills
- responses to solving problems
- ways of doing things. (Learners use their own ways of solving maths problems. These may be quite different from your methods, but this does not make them incorrect.)

Continuous assessment is especially important for helping teachers plan activities, check on learners' progress and plan additional support for learners who experience barriers to learning. (You can find more information on barriers to learning on pages 58–61.)

Assessment tools

In Grade R the focus of assessment is not to give marks but to inform detailed description and keep track of learners' progress. Teachers should use the following tools for assessment.

Observation book

In Grade R the teacher should observe learners inside and outside the classroom, during free play and structured activities. These observations will give teachers critical information that should inform their planning and selection of tasks. During the focused mathematics time, the teacher will work with one small group each day. The teacher will plan a specific activity that is linked to a concept in CAPS. While the learners are engaged in this activity, the teacher will carefully observe each learner and ask questions to gain insight into the learner's thinking and level of understanding.

Once the learners have gone home, the teacher will record the findings of these and other incidental observations. It is useful to use an indexed book to separate learners according to the first letter of their name.

Swi kahle swinene ku tirhisa tindlela to hambanahambana to tala ta ku kambela vadyondzi. Hi leswi swikombiso swin'wana.

- Xiya vadyondzi hi nkarhi wa migingiriko ya tlilasi hinkwayo, ya mitlawa leyitsongo leyi leteriwaka i mudyondzisi na ku tlanga va tshunxekile endzeni na le handle ka kamara ro dyondzela.
- Rhekoda ntwisiso wa vadyondzi wa minongoti ya matematiki yo kongoma hi nkarhi wa migingiriko leyi leteriwaka hi mudyondzi.
- Swivutiso na mivulavulo na vadyondzi hi un'weun'we kumbe mitlawa leyitsongo ya vadyondzi swi nga ku pfuna ku twisisa levhele na vuenti bya maehleketelelo ya vadyondzi.
- Languta hi vukheta swilo leswi vadyondzi va swi endlaka kutani u swi rhekoda (tirhisa swifaniso, swidirowiwa, michumu na/kumbe 'ku tsala'). Leswi swi ku komba leswi vadyondzi va swi twisisaka na leswi va swi fikeleleke.
- Ku yingisela na ku rhekoda miangulo ya vadyondzi (yo endla, ya swa nomu, yo tsariwa) swi ku pfumelela ku endla makambelelo lama yaka emahlweni.

U fanele ku ya emahlweni u kambela vadyondzi hinkwavo leswi:

- vutivi bya matematiki
- ntwisiso wa matematiki
- swikili swa matematiki
- miangulo ya ku ololoxa swiphiqo
- tindlela ta ku endla swilo. (Vadyondzi va tirhisa tindlela ta vona vini ku ololoxa swiphiqo swa matematiki. Leswi swi nga ha va swi hambanile swinene na maendlelo ma wena kambe leswi a swi va endli va va va nga endlangi swona.)

Makambelelo lama yaka emahlweni i ya nkoka ngopfungopfu eka ku pfuna vadyondzisi ku kunguhata migingiriko, ku kambisisa ku ya emahlweni ka matirhelo ya vadyondzi na ku kunguhata nseketelo wo engetela wa vadyondzi lava va hlanganaka na swirhalanganyi eka ku dyondza. (U nga kuma vuxokoxoko byo tala hi swirhalanganyi swa ku dyondza eka tipheji ta 58–61.)

Switirho swa makambelelo

Eka Giredi ya V nkongomo wa makambelelo a hi ku nyika timaraka kambe i ku nyika nhlamuselo leyi nga na vuxokoxoko na ku tshama u ri karhi u landzelerisa ku ya emahlweni ka matirhelo ya vadyondzi. Vadyondzisi va fanele ku tirhisa switirho leswi landzelaka swa makambelelo.

Buku ya mixiyaxiyo

Eka Giredi ya V mudyondzisi u fanele ku xiya vadyondzi endzeni na le handle ka kamara ro dyondzela, hi nkarhi wa ku tlanga va tshunxekile na migingiriko leyi nga na xivumbeko. Mixiyaxiyo leyi yi ta nyika vadyondzi vuxokoxoko bya nkoka lebyi byi faneleke ku letela nkunguhato wa vona na mitirho leyi hlawuriweke. Hi nkarhi wa matematiki lowu kongomisaka, mudyondzisi u ta tirha na ntlawa lowutsongo wun'we siku rin'wana na rin'wana. Mudyondzisi u ta kunguhata nghingiriko wo kongoma lowu fambelanisiweke na nongoti wa XIPHOKHAMA. Loko vadyondzi va ha tirhana na nghingiriko lowu, mudyondzisi u ta xiya hi vukheta mudyondzi un'wana na un'wana na ku vutisa swivutiso ku kuma ntwisiso wa maehleketelo na levhele ya ntwisiso wa mudyondzi.

Xikan'wekan'we loko vadyondzi va yile ekaya, mudyondzisi u ta rhekoda swikumiwa swa mixiyaxiyo leyi na yin'wana leyi nga ya xiwelo. Swa pfuna ku tirhisa buku leyi nga na swikombo ku hambanisa vadyondzi hi ku ya hi letere ro sungula ra vito ra vona.

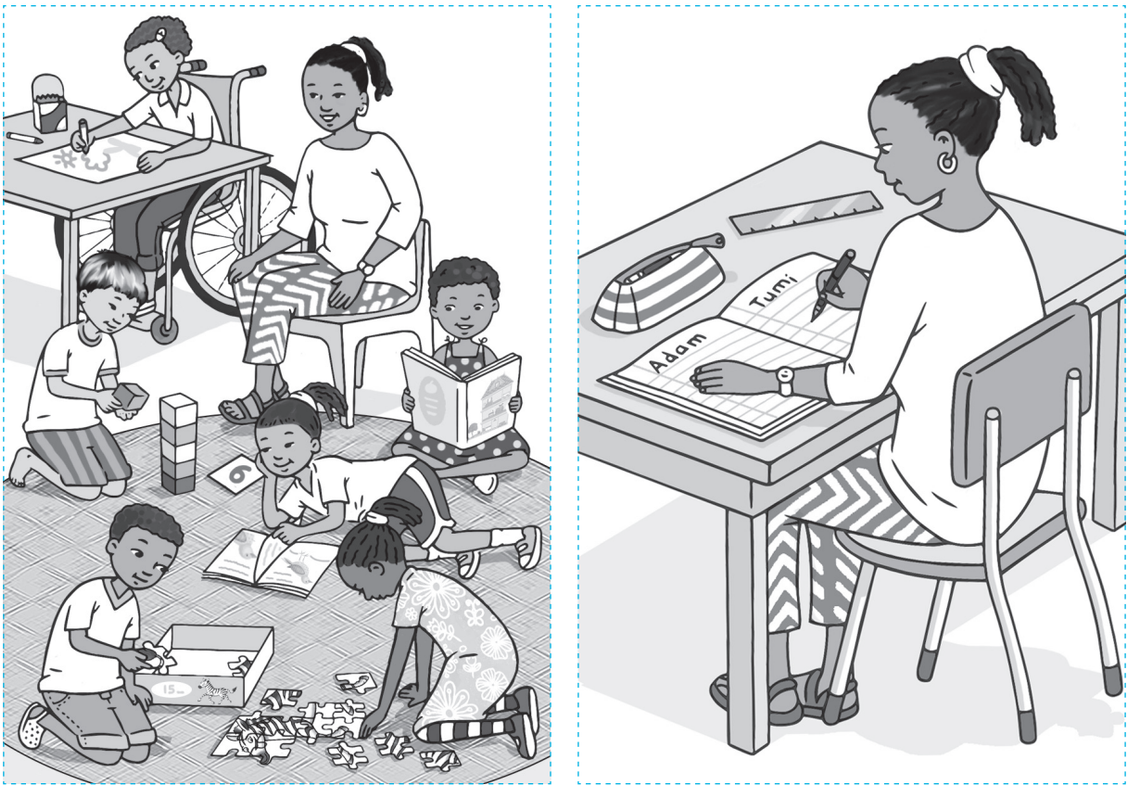


Figure 37 Observe learners then record your observations

Checklists

A checklist is a list of assessment criteria that gives a summary of each learner's skills and abilities for each subject. At the end of each *Activity Guide* of the Grade R Maths programme there is an assessment checklist for the term. This checklist provides a summary of the new content that has been taught during that term. The teacher can use symbols to show the learner's level of achievement. For example, use a tick if the skill was achieved, use a cross if it was not achieved, and use a dot to indicate that the learner is not fully competent, but is showing indications that they are on their way to achieving the skill.

Figure 38 gives an example of how the content the teacher needs to record, can be arranged. Learners' names are recorded in the first column followed by the assessment date. A symbol (✓ ✗ ●) should then be recorded next to each learner's name to correspond with the concept or skill listed in each column. This assessment tool is only useful if teachers have a very good knowledge of each learner, based on their continuous observations and the notes they recorded in their observation book.

Xifaniso xa 37 Xiya vadyondzi kutani u rhekhoda mixiyaxiyo ya wena

Minongoloko yo kambisisa (‘minongonoko yo kambela’)

Nongoloko wo kambisisa i nongoloko wa swilaveko swa makambelelo lowu wu nyikaka nkomiso wa swikili na vuswikoti bya mudyondzi un’wana na un’wana bya dyondzo yin’wana na yin’wana. Emakumu ka *Xiletelo xa Migingiriko* xin’wana na xin’wana xa nongonoko wa *Grade R Maths* ku na nongoloko wo kambisisa wa makambelelo wa kotara. Nongonoko lowu wa makambelelo wu nyika nkomiso wa vundzeni lebyintshwa lebyi byi dyondzisiweke hi nkarhi wa kotara yaleyo. Mudyondzisi a nga tirhisa mifungho ku komba levhele ya vadyondzi ya vuswikoti. Tanihi xikombiso, tirhisa nkhwaju loko xikili lexi xi fikeleriwile, tirhisa xihambano loko xi nga fikeleriwangi, naswona tirhisa nthonsi ku komba leswaku mudyondzi loyi a nga na vuswikoti byo hetiseka, kambe u komba swikombo swa leswaku u le ku ringeteni ku kota xikili lexi.

Xifaniso xa 38 xi nyika xikombiso xa hilaha vundzeni lebyi mudyondzisi a fanelaka ku byi rhekoda, byi nga lulamisiwa. Mavito ya vadyondzi ma nga rhekodiwa eka kholomu yo sungula ma landzeriwa hi siku ro kambela. Kutani mfungho (✓ ✗ ●) wu fanele ku rhekodiwa etlhelo ka vito ra mudyondzi un’wana na un’wana ku fambelana na nongoti kumbe xikili lexi longoloxiweke eka kholomu yin’wana na yin’wana. Switirho leswa makambelelo swi pfuna ntsena loko vadyondzisi va ri na vutivi bya kahle swinene bya mudyondzi un’wana na un’wana, lebyi simekiweke ehenhla ka mixiyaxiyo ya vona leyi yaka emahlweni na tinotsi leti va ti rhekodeke ebukwini ya vona ya mixiyaxiyo.

Term 1: Exemplar Record of Continuous Assessments

Key	NUMBERS, OPERATIONS AND RELATIONSHIPS													PATTERNS, FUNCTIONS AND ALGEBRA					COMMENTS	
✓ = competent ● = partially competent ✗ = not yet competent **Learners' names**	Counts forwards to 10	Estimates and counts objects 1–5	Counts backwards 5–1	Recognises numbers in familiar contexts	Understands ordinal numbers, e.g. lining up	Identifies dot/pictures cards 1–3	Identifies number symbols: 1	Identifies number names: one	Orders numbers: 1–3	Understands one-to-one correspondence	Distinguishes between many and fewer	Solves problems with concrete objects	Solves problems using fingers or counters	Identifies patterns in environment	Recognises the 'repeat' in patterns	Copies patterns using body percussion	Copies, completes and creates own patterns	Explains own pattern (repeating rule)		Final coding
Date																				

Figure 38 Exemplar checklist

Kotara ya 1: Rhekodo ya Xikombiso ya Makambelelo lama yaka Emahlweni

Khiya	TINOMBORO, TIOPAREXINI NA VUXAKA												TIPATIRONI, TIFANKIXINI NA ALIJEBURA					SWIBUMABUMELO	
✓ = u na vuswikoti ● = u na vuswikoti byitsongo ✗ = a nga si va na vuswikoti **Mavito ya vadyondzi**	U hlayela ku ya emahlweni kufika eka 10	U pimanisa na ku hlayela michumu 1–5	U hlayela ku ya endzhaku 5–1	U lemuka tinomboro eka mivangu leyi nga toloveleke	U twisisa tinomboro ta odinali, xik. ku fola	U kuma makhadi ya mathonsi/swifaniso 1–3	U kuma mifungho ya tinomboro: 1	U kuma mavito ya tinomboro: n'we	U longoloxa tinomboro: 1–3	U twisisa ku yelana ka xin'we-eka-xin'we	U hambanisa exikarhi swotala na swingariswingani	U ololoxa swiphiqo hi michumu yo khomeka	U ololoxa swiphiqo hi tintiho kumbe swo hlayela	U kuma tipatironi leti nga eka mbangu	U lemuka 'mbuyelelo' eka tipatironi	Wa kopunula tipatironi hi ku tirhisa mpfumawulo lowu humesiwaka hi swirho swa miri	Wa kopunula, wa hetisa na ku tumbuluxa tipatironi ta yena n'wini	U hlamusela tipatironi ta yena n'wini (nawu wo vuyelela)		Ku nyika khodi ro hetelela
Siku																			

Xifaniso xa 38 Xikombiso xa nongonoko wo kambisisa

Rubrics

A rubric is another tool for assessing learners' achievements. It also consists of a list of criteria with a description of levels of performance for a particular skill. Each description explains what the learner actually does or produces during an assessment task for that criteria. A rubric needs to provide well-written descriptions and levels of performance so that these can be accurately matched against each learner's performance. The rubric then allows teachers to be more objective and consistent in their assessment and guides their planning of further teacher activities as it highlights the strengths and gaps in the learners' knowledge.

Figure 39 provides an example of a rubric for solving addition problems up to 10 in a practical way.

Criteria	Not achieved [1]	Elementary achievement [2]	Moderate achievement [3]	Adequate achievement [4]	Substantial achievement [5]	Meritorious achievement [6]	Outstanding achievement [7]
Solves addition problems practically up to 10.	Unable to solve problems practically.	Is able to solve problems practically, using concrete apparatus.	Is able to solve problems practically, but cannot explain solution method.	Is able to solve problems practically and describes solution method when prompted.	Is able to solve problems practically and describes solution method independently.	Is able to solve problems practically and is able to explain solution method.	Is able to solve problems practically and is able to explain solution method and suggest alternative methods.

Figure 39 Exemplar rubric

The level descriptors on the rubric can be linked to rating codes. The Department of Basic Education (DBE) provides a rating code and description of competence, and links these to percentages (see Figure 40). For reporting purposes the rating codes and descriptors could be converted to percentages.

Tirhubiriki

Rhubiriki i xitirho xin'wana xa ku kambela vuswikoti bya vadyondzi. Yi tlhela yi vumbiwa hi nongoloko wa swilaveko leswi nga na nhlamuselo ya tilevhele ta matirhelo eka xikili xo karhi. Nhlamuselo yin'wana na yin'wana yi hlamusela leswi mudyondzi hakunene a swi endlaka kumbe a swi humesaka hi nkarhi wa ntirho wa makambelelo eka xilaveko xexo. Rhubiriki yi lava ku nyika tihlamuselo to tsariwa kahle na tilevhele ta matirhelo ku endla leswaku leswi swi nga kota ku pananisiwa hi ku kongoma matirhelo ya mudyondzi. Rhubiriki yi pfumelela vadyondzisi ku languta swilo tanihileswi swi nga xiswona na ku endla ku fanana eka makambelelo ya vona naswona yi letela nkunguhato wa vona wa migingiriko ya mudyondzi yo yisa emahlweni tanihiloko yi kombisa matimba na mavangwa lama nga eka vutivi bya vadyondzi.

Xifaniso xa 39 xi nyika xikombiso xa rhubiriki yo ololoxa swiphiqo swo hlanganisa kufika eka 10 hi ndlela yo endla.

Swilaveko	**Vuswikoti byo ka byi nga fikelelangi [1]**	**Vuswikoti bya le hansi [2]**	**Vuswikoti byo enelanyana [3]**	**Vuswikoti byo eneta [4]**	**Vuswikoti byo amukeleka [5]**	**Vuswikoti bya le henhla [6]**	**Vuswikoti bya le henhla ngopfu [7]**
Ololoxa swiphiqo swo hlanganisa hi ku endla kufika eka 10.	A nga koti ku ololoxa swiphiqo hi ku endla.	U kota ku ololoxa swiphiqo hi ku endla, hi ku tirhisa switirhisiwa swo khomeka.	U koya ku ololoxa swiphiqo hiku endla, kambe a nga koti ku hlamusela endlelo ra xitshunxo.	U kota ku ololoxa swiphiqo hi ku endla na ku hlamusela endlelo ra xitshunxo loko a nyikiwa vuthala byo khutaza.	U kota ku ololoxa swiphiqo hi ku endla na ku hlamusela endlelo ra xitshunxo hi yexe.	U kota ku ololoxa swiphiqo hi ku endla naswona u kota ku hlamusela endlelo ra xintshunxo.	U kota ku ololoxa swiphiqo hi ku endla naswona u kota ku hlamusela endlelo ra xitshunxo na ku ringanyeta maendlelo man'wana.

Xifaniso xa 39 Xikombiso xa rhubiriki

Swihlamuseri swa tilevhele eka rhubiriki ti nga fambelanisiwa na tikhodi to pima. Ndzawulo ya Dyondzo ya Masungulo (DBE) yi nyika khodi yo pima na nhlamuselo ya vuswikoti, naswona yi fambelanisa leswi na tiphesente (vona Xifaniso xa 40). Eka swikongomelo swa ku endla tirhipoto tikhodi to pima na swihlamuseri swi nga hundzuluxeriwa eka tinhlayo hi tiphesente.

Rating code	Description of competence	Percentage
7	Outstanding achievement	80–100
6	Meritorious achievement	70–79
5	Substantial achievement	60–69
4	Adequate achievement	50–59
3	Moderate achievement	40–49
2	Elementary achievement	30–39
1	Not achieved	0–29

Figure 4.0 Rating code

In Grade R the focus of assessment is on describing performance rather than evaluating it against percentages. Reports that provide parents and other teachers with rich descriptions of behaviours and what learners produce, are far more valuable for assessing performance than percentages are. It is best to avoid negative evaluative assessments that fail learners early on in the system. Assessment should be used to gain insight into the learners' level of competence in order to adjust planning and teaching to accommodate and encourage each learner in the class.

You will need to record your assessment observations and other 'evidence' in a journal, and on an observation sheet or checklist. In this way, during the year, a complete picture of each learner, with all their strengths and weaknesses, is gradually built up.

Khodi yo pima	Nhlamuselo ya vuswikoti	Phesente
7	Vuswikoti bya le henhla ngopfu	80–100
6	Vuswikoti bya le henhla	70–79
5	Vuswikoti byo amukeleka	60–69
4	Vuswikoti byo eneta	50–59
3	Vuswikoti byo enelanyana	40–49
2	Vuswikoti bya le hansi	30–39
1	Vuswikoti byo ka byi nga fikelelangi	0–29

Xifaniso xa 4.0 Khodi yo pima

Eka Giredi ya V nkongomo wa makambelelo wu le ka ku hlamusela matirhelo ematshan'wini ya ku ma kambela ehenhla ka tinhlayo hi tiphesente. Tirhipoto leti ti nyikaka vatswari na vadyondzisi van'wana hi tinhlamuselo yo fuwa ta mahanyelo na leswi vana va swi humesaka, ti na nkoka swinene eka ku kambela matirhelo lama ma nga tinhlayo hi tiphesente. Swi kahle swinene ku papalata makambelelo yo homboloka lama tsandzekisaka vadyondzi ka ha ri emasungulweni ya sisiteme. Makambelelo ya fanele ku tirhisiwa ku kuma ntwisiso eka levhele ya vuswikoti ya vadyondzi hi xikongomelo xa ku fambelanisa nkunguhato na madyondziselo ku amukela na ku khutaza mudyondzi un'wana na un'wana loyi a nga etlilasini.

U ta fanela ku rhekoda mixiyaxiyo ya wena ya makambelelo na 'vumbhoni' byin'wana eka jenali, na le ka phepha ra nxiyaxiyo kumbe nongoloko wo kambela. Hi ndlela leyi, elembeni, xifaniso xo hetiseka xa mudyondzi un'wana na un'wana, lexi nga na vuswikoti na vutsandzeki bya yena, xi akiwa hi katsongotsongo.

SECTION 3

Mathematics in Grade R

Introduction

This section of the *Concept Guide* provides an overview of the Content Areas of the Grade R Mathematics CAPS and:

- offers practical ideas for classroom implementation
- explains the maths concepts and content that teachers need to understand
- highlights the development of maths knowledge in young learners.

It also gives a breakdown of the Term 1–4 Grade R content (pages 114 to 137). The five CAPS Content Areas are:

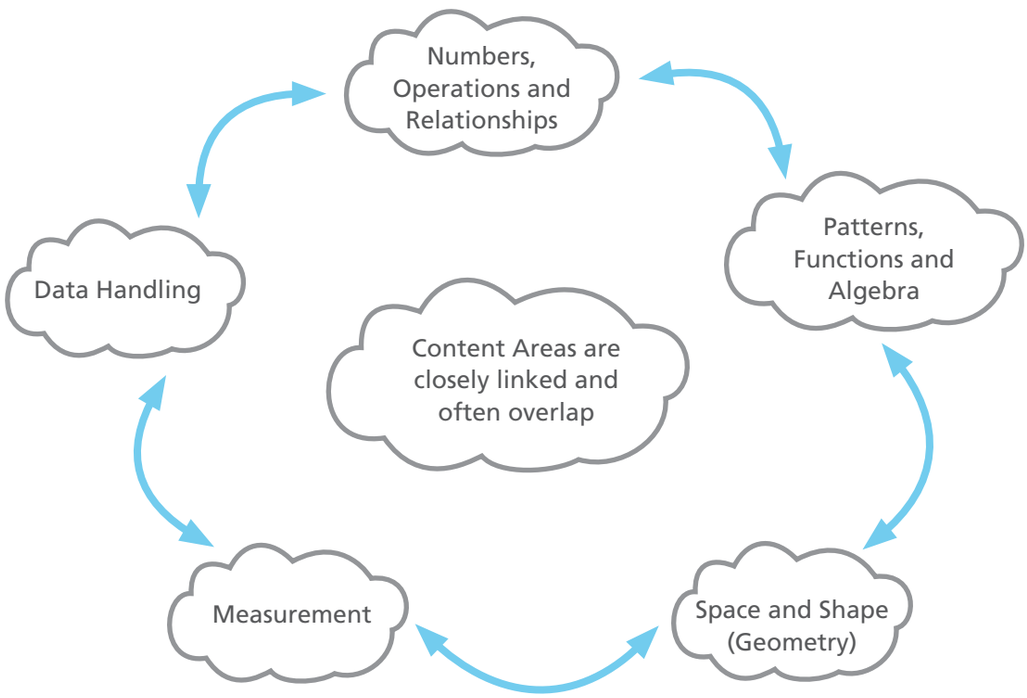


Figure 4.1 Grade R CAPS Mathematics Content Areas

Each Content Area is divided into topics. For each of these topics, this section of the *Concept Guide* provides:

- an explanation of the topic, which includes identifying specific concepts and skills
- teaching suggestions in the 'In practice' boxes
- an explanation of maths terms.

XIYENGE XA 3

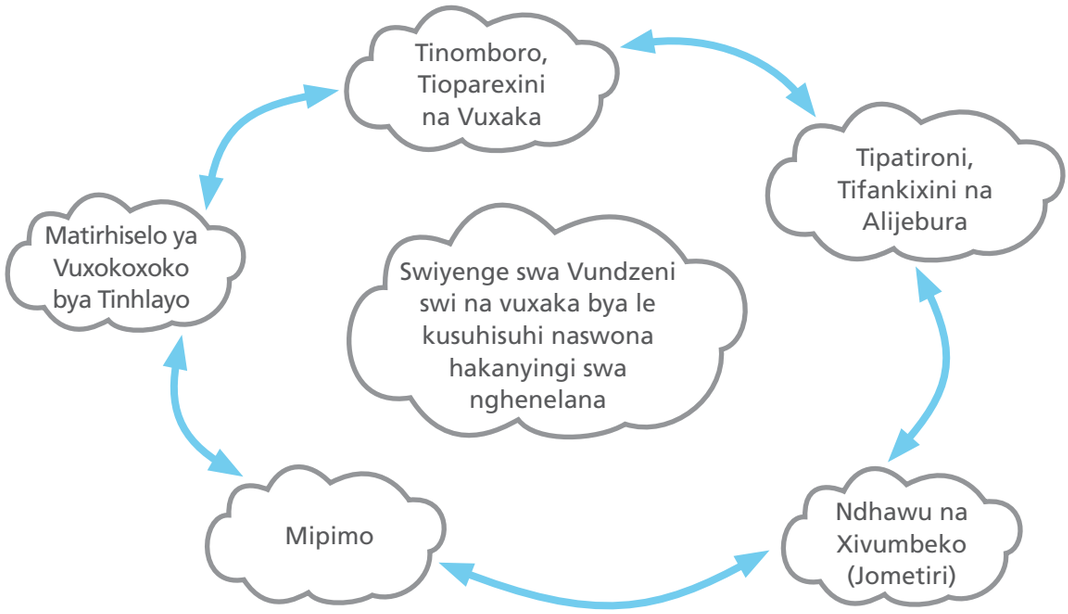
Matematiki eka Giredi ya V

Manghenelo

Xiyenge lexi xa *Xiletelo xa Minongoti* xi nyika nkatsakanyo wa Swiyenge swa Vundzeni swa Matematiki wa Giredi ya V wa XIPHOKHAMA naswona:

- xi nyika mianakanyo yo tirhiseka ya ntirhiso wa le kamareni ro dyondzela
- xi hlamusela minongoti ya matematiki na vundzeni lebyi vadyondzisi va faneleke ku byi twisisa
- xi kombisa ku kula ka vutivi bya matematiki eka vadyondzi lavatsongo.

Xi tlhela xi nyika ntlhantlho wa vundzeni bya Giredi ya V bya Kotara ya 1–4 (tipheji ta 114–137). Swiyenge swa Vundzeni swa XIPHOKHAMA leswa ntlhanu hi leswi:



Xifaniso xa 4.1 Swiyenge swa Vundzeni swa Matematiki wa XIPHOKHAMA wa Giredi ya V

Xiyenge xa Vundzeni xin'wana na xin'wana xi avanyisiwile hi tinhlokomhaka. Eka yin'wana na yin'wana ya tinhlokomhaka leti, xiyenge lexi xa *Xiletelo xa Minongoti* xi nyika:

- nhlamuselo ya nhlokomhaka, leyi yi katsaka ku tiva minongoti na swikili swo kongoma
- swiringanyeto swa madyondziselo leswi nga emabokisini ya 'Eka maendlelo'
- nhlamuselo ya matheme ya metse.

Although the Content Areas reflect particular strands of maths development, they are all closely linked and often overlap during activities. For example, when learners are focusing on a measurement task, they will integrate skills from another Content Area, for example, Numbers, Operations and Relationships, and so also use their knowledge of numbers, counting and skills of comparison. Learners have opportunities to apply their knowledge and skills in different contexts.

In practice ...

While teachers focus specifically on these Content Areas during the maths focus time, they should also remember to make the most of other opportunities in the daily programme to:

- use maths language to introduce and reinforce concepts
- model the use of a wide range of vocabulary linked to number, shape, space, measurement and data handling.

Here are some practical ways to do this:

- Provide bought, recycled and natural materials for learners to sort, compare and order.
- Provide resources to role-play buying and selling, weighing and measuring.
- Make sets of pictures to show the sequence of events during the day and the weather during the week.
- Observe and talk about shape and patterns in pathways, fences, vegetable gardens.
- Plan activities and games where learners use their physical and mathematical skills to follow and give directions.
- Link stories and outdoor play to maths.

Mathematics content

The content overview that follows provides a table of the Grade R Maths content to be taught in the Grade R year. It shows what content is to be taught each term.

- The text in blue is the content from the Grade R CAPS for Mathematics.
- The text descriptions and content in black have been added to extend and build on CAPS.
- The topics are sequenced to show a developmental progression from one topic to another.

Hambileswi Swiyenge swa Vundzeni swi kombisaka marhavi yo karhi ka nhluvukiso wa metse, hinkwaswo swi na vuxaka bya le kusuhisuhi naswona hakanyingi swa nghenelana hi nkarhi wa migingiriko. Tanihi xikombiso, loko vadyondzi va kongomisa eka ntirho wo pima, va ta pfanganisa swikili swo huma eka Xiyenge xa Vundzeni xin'wana, tanihi xikombiso, Tinomboro, Tioparexini na Vuxaka, kutani hi ndlela yaleyo va tlhela va tirhisa vutivi bya vona bya tinomboro, ku hlayela na swikili swa ku pimanisa. Vadyondzi va kuma mikarhi ya ku tirhisa vutivi na swikili swa vona eka mivangu yo hambanahambana.

Eka maendlelo ...

Loko vadyondzisi va kongomisa ngopfungopfu eka Swiyenge swa Vundzeni leswi hi nkarhi wa nkongomo wa metse, va fanele ku tlhela va tsundzuka ku tirhisa hi ndlela leyi vuyerisaka mikarhi yin'wana leyi nga eka nongonoko wa siku na siku ku:

- tirhisa ririmi ra metse ku tivisa na ku tiyisisa minongoti
- kombisa matirhiselo ya ntivomarito yo hambanahambana swinene lama ya fambelanaka na nomboro, xivumbeko, ndhawu, mpimo na matirhiselo ya vuxokoxoko bya tinhlayo.

Hi leti tindlela tin'wana to tirhiseka ta ku endla leswi:

- Nyika vadyondzi timatheriyali leti xaviweke, vuyelerisiweke na ta ntumbuluko leswaku va ti ava, pimanisa na ku ti xaxameta.
- Nyika swipfuno swa ku encenyeta ku xava na ku xavisa, ku kala na ku pima.
- Endla swikatsa swa swifaniso ku komba malongolokelo ya swiendleko esikwini na maxelo evhikini.
- Xiyaxiya na ku vulavula hi mayelana na xivumbeko na tipatironi leti nga etindleleni, etidarateni, eswirhapeni swa matsavu.
- Kunguhata migingiriko na mitlangu laha vadyondzi va tirhisaka swikili swa miri na swa matematiki ku landzelela na ku nyika matlhelo.
- Xakelanisa switori na mitlangu ya le handle ka miako na metse.

Vundzeni bya Matematiki

Nkatsakanyo wa vundzeni lowu landzelaka wu nyika tafula ra vundzeni bya *Grade R Maths* lebyi faneleke ku dyondzisiwa hakona eka lembe ra Giredi ya V. Byi komba leswaku i vundzeni byihi byi faneleke ku dyondziwa eka kotara yin'wana na yin'wana.

- Xitsariwa lexi nga hi muhlovo wa wasi i vundzeni kusuka eka XIPHOKHAMA xa Giredi ya V xa Matematiki.
- Tinhlamuselo ta xitsariwa na vundzeni leswi nga hi muhlovo wa ntima swi engeteriwile ku ndlandlamuxa na ku aka ehenhla ka XIPHOKHAMA.
- Tinhlokomhaka ti longoloxiwile ku komba ku ya emahlweni ka nhluvukiso kusuka eka nhlokomhaka yin'we kuya eka yin'wana.

1. NUMBERS, OPERATIONS and RELATIONSHIPS					
	TOPIC	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**
COUNTING					
1.1	**Count objects (Estimate and count objects to develop number sense)**	**Number range: 1–5** Count in ones: one-to-one correspondence: body parts and concrete objects Introduce the Helper's chart Introduce the concept of estimation (a reasonable guess) Dot cards: - identify number dots on cards, dominoes and dice (1–5) - match objects to pictures and dot cards Count 'how many' using fingers, dot cards, objects in and outside the classroom, pictures and actions, e.g. clapping hands, stamping feet	**Number range: 1–7** Estimate and count Count in ones: one-to-one correspondence: body parts and concrete objects Reinforce Helper's chart Dot cards: - identify number of dots on cards, dominoes and dice (1–6) - match objects to pictures and dot cards Use a range of contexts, objects and events for counting 'how many'. Fingers, dot cards, ten structure beads, other objects in and outside the classroom, pictures and actions, e.g. clapping hands, stamping feet Show 'one more/ one less' Clap many times/ fewer times	**Number range: 1–10** Estimate and count Count in ones: one-to-one correspondence; count all: - body parts - concrete objects Reinforce Helper's chart Dot cards: recognise collections of dots 1–5 and up to 3 more on cards, dice and dominoes Start at given number and 'count on' jumping along a number track, using ten structure beads, picture cards, number washing line Show 'one more/ one less; two more/ three less' Clap many times/ fewer times: - which number of claps are more/less, most/least	**Number range: 0–10 and beyond** Estimate and count Count in ones: one-to-one correspondence; count all: - body parts - concrete objects Reinforce Helper's chart Dot cards: recognise collections of dots 1–5 and up to 5 on dice (1–6) and dominoes Start at given number and 'count on' jumping along a number track, using ten structure beads, picture cards, number washing line Show 'one more/ one less; two more/ three less' Clap many times/ fewer times: - which number of claps are more/less, most/least Meaning of zero (nought) '0'
1.2	**Count forwards and backwards** **Oral or rote counting (rhythmic)**	**Counting forwards: 1–10** **Counting backwards: 5–1** Incidental counting using number rhymes and songs, daily routine, body movements, etc. Count in ones Number range: 1	**Counting forwards: 1–15** **Counting backwards: 7–1** Incidental counting using number rhymes and songs, daily routine, body movements, etc. Count in ones Number range: 1–4	**Counting forwards: 1–20** **Counting backwards: 10–1** Incidental counting using number rhymes and songs, daily routine, body movements, etc. Count in ones Number range: 1–7	**Counting forwards: 0–20 and beyond** **Counting backwards: 10–0** Incidental counting using number rhymes and songs, daily routine, body movements, etc. Count in: ones, twos Number range: 0–10

1. TINOMBORO, TIOPAREXINI na VUXAKA					
	NHLOKOMHAKA	**KOTARA YA 1**	**KOTARA YA 2**	**KOTARA YA 3**	**KOTARA YA 4**
KU HLAYELA					
1.1	**Hlayela michumu (Pimanyeta na ku hlayela michumu ku ndlandlamuxa ntwisiso wa tinomboro)**	**Vunavi bya tinomboro: 1–5** Hlayela hi va n'we: ku yelana ka xin'we-eka-xin'we: swirho swa miri na michumu yo khomeka Tivisa chati ya Mupfuni Tivisa nongoti wa ku pimanyeta (ku vhumba ko tivikana) Makhadi ya mathonsi: - kuma mathonsi ya tinomboro lama nga eka makhadi, tidomino na madayizi (1–5) - pananisa michumu eka swifaniso na makhadi ya mathonsi Hlayela leswaku i 'mangani' hi ku tirhisa tintiho, makhadi ya mathonsi, michumu leyi nga endzeni na le handle ka kamara ro dyondzela, swifaniso na swiendlo, xik. ku phokotela swandla, ku gima mikondzo	**Vunavi bya tinomboro: 1–7** Pimanyeta na ku hlayela Hlayela hi va n'we: ku yelana ka xin'we-eka-xin'we: swirho swa miri na michumu yo khomeka Tivisa chati ya Mupfuni Makhadi ya mathonsi: - kuma mathonsi ya tinomboro lama nga eka makhadi, tidomino na madayizi (1–6) - pananisa michumu eka swifaniso na makhadi ya mathonsi Tirhisa vunavi bya mivangu, michumu na swiendleko eka ku hlayela leswaku i 'mangani'. Tintiho, makhadi ya mathonsi, khume ra swivumbeko swa vuhlalu, michumu yin'wana leyi nga endzeni na le handle ka kamara ro dyondzela, swifaniso na swiendlo, xik. ku phokotela swandla, ku gima mikondzo Komba 'xin'we swo tala/xin'we switsongo' Phokotela ko tala/ kutsongo	**Vunavi bya tinomboro: 1–10** Pimanyeta na ku hlayela Hlayela hi va n'we: ku yelana ka xin'we-eka-xin'we; hlayela hinkwaswo: - swirho swa miri - michumu yo khomeka Tivisa chati ya Mupfuni Makhadi ya mathonsi: lemuka mihlengelo ya mathonsi ya 1–5 na kufika eka 3 man'wana lama nga eka makhadi, madayizi na tidomino Sungula eka nomboro leyi nyikiweke kutani u 'hlayela kuya emahlweni' u ri karhi u tlula xiporo xa tinomboro, u ri karhi khume ra vuhlalu bya xivumbeko, makhadi ya swifaniso, mugiva wa tinomboro Komba 'xin'we swo tala/xin'we xitsongo; swimbithi swo tala/ swinharhu switsongo' Phokotela ko tala/ kutsongo: - hi kwihi ku phokotela loku nga tala/ kutsongo; tala ngopfu/ku tsongo ngopfu	**Vunavi bya tinomboro: 0–10 na ku hundza** Pimanyeta na ku hlayela Hlayela hi va n'we: ku yelana ka xin'we-eka-xin'we; hlayela hinkwaswo: - swirho swa miri - michumu yo khomeka Tivisa chati ya Mupfuni Makhadi ya mathonsi: lemuka mihlengelo ya mathonsi ya 1–5 na kufika eka 5 lama nga eka madayizi (1–6) na tidomino Sungula eka nomboro leyi nyikiweke kutani u 'hlayela kuya emahlweni' u ri karhi u tlula xiporo xa tinomboro, u ri karhi khume ra vuhlalu bya xivumbeko, makhadi ya swifaniso, mugiva wa tinomboro Komba 'xin'we swo tala/xin'we xitsongo; swimbithi swo tala/ swinharhu switsongo' Phokotela kotala/ kutsongo: - hi kwihi ku phokotela loku nga tala/ kutsongo; tala ngopfu/ku tsongo ngopfu Nhlamuselo ya ziro (noto) '0'
1.2	**Hlayela kuya emahlweni na le ndzhaku** **Ku hlayela ka swa nomu kumbe ku bela enhlokweni (swa ncino)**	**Ku hlayela kuya emahlweni: 1–10** **Ku hlayela kuya endzhaku: 5–1** Ku hlayela ko ka ku nga kunguhatiwangi hi ku tirhisa tirhayimi na tinsimu, nghingiriko wa siku na siku, mifambafambo ya swirho swa miri, sw. na sw. Hlayela hi va n'we Vunavi bya tinomboro: 1	**Ku hlayela kuya emahlweni: 1–15** **Ku hlayela kuya endzhaku: 7–1** Ku hlayela ko ka ku nga kunguhatiwangi hi ku tirhisa tirhayimi na tinsimu, nghingiriko wa siku na siku, mifambafambo ya swirho swa miri, sw. na sw. Hlayela hi va n'we Vunavi bya tinomboro: 1–4	**Ku hlayela kuya emahlweni: 1–20** **Ku hlayela kuya endzhaku: 10–1** Ku hlayela ko ka ku nga kunguhatiwangi hi ku tirhisa tirhayimi na tinsimu, nghingiriko wa siku na siku, mifambafambo ya swirho swa miri, sw. na sw. Hlayela hi va n'we Vunavi bya tinomboro: 1–7	**Ku hlayela kuya emahlweni: 0–20 na ku hundza** **Ku hlayela kuya endzhaku: 10–0** Ku hlayela ko ka ku nga kunguhatiwangi hi ku tirhisa tirhayimi na tinsimu, nghingiriko wa siku na siku, mifambafambo ya swirho swa miri, sw. na sw. Hlayela hi va n'we, vambirhi Vunavi bya tinomboro: 0–10

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
1.3	**Number symbols and number names** **Recognise and identify number symbols and number names**	**Number symbols: 1, 2, 3** **Number names: one, two, three** Represent numbers using: - body (kinaesthetic) - objects (concrete) - pictures, drawings (semi-concrete) - dot cards (semi-concrete) Match with number symbol (abstract) and number name Number symbol: 1 Number name: one	**Number symbols: 4 and 5** **Number names: four, five** Represent numbers using: - body (kinaesthetic) - objects (concrete) - pictures, drawings (semi-concrete) - dot cards (semi-concrete) Match with number symbol (abstract) and number name Reinforce: 1, 2, 3 Reinforce: one, two, three Number symbol: 2, 3, 4 Number name: two, three, four	**Number symbols: 6, 7, 8** **Number names: six, seven, eight** Represent numbers using: - body (kinaesthetic) - objects (concrete) - pictures, drawings (semi-concrete) - dot cards (semi-concrete) Match with number symbol (abstract) and number name Reinforce: 1, 2, 3, 4, 5 Reinforce: one, two, three, four, five Number symbol: 5, 6, 7 Number name: five, six, seven	Number symbol: 0 to 10 Number name: zero (nought), eight, nine, ten Represent numbers using: - body (kinaesthetic) - objects (concrete) - pictures, drawings (semi-concrete) - dot cards (semi-concrete) Match with number symbol (abstract) and number name Reinforce all numbers
NUMBER RECOGNITION					
1.4	**Use numbers in familiar contexts**	Use numbers in familiar contexts: - age - numbers in pictures and dot cards - number card games - attendance register	Use numbers in familiar contexts: - address - numbers in pictures and dot cards - number card games - numbers in adverts/ flyers/birthday cards - attendance register	Use numbers in familiar contexts: - address, contact numbers - birthday - numbers in pictures and dot cards - number card games - numbers in adverts/ flyers/birthday cards - attendance register	Use numbers in familiar contexts: - address, contact numbers - numbers in pictures and dot cards - number card games - numbers in adverts/ flyers/birthday cards - attendance register
NUMBER SENSE (RELATIONSHIPS) **Describe, compare and order numbers**					
1.4	**Identify and describe whole numbers**	**Number range: 1–3** Identify and describe whole numbers up to 1, 2, 3 using collections and symbols (one more, one less than; before, after, between) Number range: 1	**Number range: 1–5** Identify and describe whole numbers 4, 5 using collections and symbols Reinforce numbers 1–3	**Number range: 1–8** Identify and describe whole numbers 6, 7, 8 using collections and symbols Reinforce numbers 1–5 Number range: 1–7	**Number range: 0–10** Identify and describe whole numbers 0, 9, 10 Reinforce numbers 1–8

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
1.3	**Mifungho ya tinomboro na mavito ya tinomboro** **Lemuka na ku kuma mifungho ya tinomboro na mavito ya tinomboro**	**Mifungho ya tinomboro: 1, 2, 3** **Mavito ya tinomboro: n'we, mbirhi, nharhu** Endla vuyimeri bya tinomboro hi ku tirhisa: - miri (ku dyondza hi ku tirhisa swirho) - michumu (yo khomeka) - swifaniso, swidirowiwa (vuyimeri) - makhadi (vuyimeri) Pananisa na mfungho wa nomboro (xianakanyiwa) na vito ra nomboro Mfungho wa nomboro: 1 Vito ra nomboro: n'we	**Mifungho ya tinomboro: 4 na 5** **Mavito ya tinomboro: mune, ntlhanu** Endla vuyimeri bya tinomboro hi ku tirhisa: - miri (ku dyondza hi ku tirhisa swirho) - michumu (yo khomeka) - swifaniso, swidirowiwa (vuyimeri) - makhadi (vuyimeri) Pananisa na mfungho wa nomboro (xianakanyiwa) na vito ra nomboro Tiyisisa: 1, 2, 3 Tiyisisa: n'we, mbirhi, nharhu Mfungho wa nomboro: 2, 3, 4 Vito ra nomboro: mbirhi, nharhu, mune	**Mifungho ya tinomboro: 6, 7, 8** **Mavito ya tinomboro: tsevu, nkombo, nhungu** Endla vuyimeri bya tinomboro hi ku tirhisa: - miri (ku dyondza hi ku tirhisa swirho) - michumu (yo khomeka) - swifaniso, swidirowiwa (vuyimeri) - makhadi (vuyimeri) Pananisa na mfungho wa nomboro (xianakanyiwa) na vito ra nomboro Tiyisisa: 1, 2, 3, 4, 5 Tiyisisa: n'we, mbirhi, nharhu, mune, ntlhanu Mfungho wa nomboro: 5, 6, 7 Vito ra nomboro: ntlhanu, tsevu, nkombo	Mfungho wa nomboro: 0 kufika eka 10 Vito ra nomboro: ziro (noto), nhungu, kaye, khume Endla vuyimeri bya tinomboro hi ku tirhisa: - miri (ku dyondza hi ku tirhisa swirho) - michumu (yo khomeka) - swifaniso, swidirowiwa (vuyimeri) - makhadi (vuyimeri) Pananisa na mfungho wa nomboro (xianakanyiwa) na vito ra nomboro Tiyisisa tinomboro hinkwato
NDZEMUKO WA TINOMBORO					
1.4	**Tirhisa tinomboro eka mivangu leyi nga toloveleka**	Tirhisa tinomboro eka mivangu leyi nga toloveleka: - malembe hi vukhale - tinomboro eka swifaniso na makhadi ya mathonsi - mitlangu ya makhadi ya tinomboro - rhijisitara ra matelo	Tirhisa tinomboro eka mivangu leyi nga toloveleka: - adirese - tinomboro eka swifaniso na makhadi ya mathonsi - mitlangu ya makhadi ya tinomboro - tinomboro leti nga eka swinavetiso/ tifulayara/makhadi ya siku ra ku velekiwa - rhijisitara ra matelo	Tirhisa tinomboro eka mivangu leyi nga toloveleka: - adirese, tinomboro ta vutihlanganisi - siku ra ku velekiwa - tinomboro eka swifaniso na makhadi ya mathonsi - mitlangu ya makhadi ya tinomboro - tinomboro leti nga eka swinavetiso/ tifulayara/makhadi ya siku ra ku velekiwa - rhijisitara ra matelo	Tirhisa tinomboro eka mivangu leyi nga toloveleka: - adirese, tinomboro ta vutihlanganisi - tinomboro eka swifaniso na makhadi ya mathonsi - mitlangu ya makhadi ya tinomboro - tinomboro leti nga eka swinavetiso/ tifulayara/makhadi ya siku ra ku velekiwa - rhijisitara ra matelo
NTWISISO WA TINOMBORO (VUXAKA) **Hlamusela, fananisa na ku xaxameta tinomboro**					
1.4	**Kuma na ku hlamusela tinomboroxiheri**	**Vunavi bya tinomboro: 1–3** Kuma na ku hlamusela tinomboroxiheri kufika eka 1, 2, 3 hi ku tirhisa mihlengelo na mifungho (n'we swo tala, n'we switsongo; emahlweni, endzhaku ka, xikarhi ka) Vunavi bya tinomboro: 1	**Vunavi bya tinomboro: 1–5** Kuma na ku hlamusela tinomboroxiheri kufika eka 4, 5 hi ku tirhisa mihlengelo na mifungho Tiyisisa tinomboro 1–3	**Vunavi bya tinomboro: 1–8** Kuma na ku hlamusela tinomboroxiheri kufika eka 6, 7, 8 hi ku tirhisa mihlengelo na mifungho Tiyisisa tinomboro 1–5 Vunavi bya tinomboro: 1–7	**Vunavi bya tinomboro: 0–10** Kuma na ku hlamusela tinomboroxiheri 0, 9, 10 Tiyisisa tinomboro 1–8

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
	Compare numbers	Compare which of two given collections of objects are: - big, small - bigger, smaller - biggest, smallest Order more than two given collections of objects from smallest to biggest and biggest to smallest Many and fewer, e.g. incidental clapping, snack time, sharing equipment	Compare which of two given collections of objects are: - big, small - bigger, smaller - biggest, smallest More than, less than, equal to Many and fewer, e.g. incidental clapping	More than, less than, equal to Many and fewer Ask questions: 'Which was most/least?'	More than, less than, equal to Many and fewer Ask questions: 'Which was most/least?'
			Make equal groups (sets) of objects, e.g. children or objects in the classroom	Use objects to make equal groups (sets)	Use objects to make equal groups (sets)
		Breaking down and building up collections of 2 and 3, e.g. 3 could be: 1 and 1 and 1 OR 2 and 1 OR 1 and 2 OR nothing (zero) and 3	Breaking down and building up collections of 4 and 5, e.g. 4 could be: 1 and 1 and 1 and 1 OR 3 and 1 OR 2 and 2 OR nothing (zero) and 4	Use manipulatives to investigate and develop strategies for breaking down and building up collections to 8	Use manipulatives to investigate and develop strategies for breaking down and building up collections to 10
	Order (sequence) numbers	Order more than two given collections of objects from smallest to biggest and biggest to smallest	Order more than two given collections of objects from smallest to biggest and biggest to smallest	Order collections of objects from smallest to biggest and biggest to smallest	Order collections of objects from smallest to biggest and biggest to smallest Match number symbol card to collections
		Incidental ordering of numbers 'What comes next, after, between': - number/washing line - number track or ladder - number cards	Place number symbols in the correct counting order 'What comes next, after, between': - number/washing line - number track or ladder - number cards	Place number symbols in the correct counting order 'What comes next, after, between': - number/washing line - number track or ladder - number cards	Incidental: Number range: 0–10 Place number symbols in the correct counting order 'What comes next, after, between': - number/washing line - number track or ladder - number cards

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
	Fananisa tinomboro	Fananisa leswaku hi yihi ya mihlengelo leyi nyikiweke yimbirhi ya michumu yi nga: - yikulu, yitsongo - yikulunyana, yitsongonyana - yikulu kutlula hinkwayo, yitsongo kutlula hinkwayo Longoloxa mihlengelo leyi nyikiweke yo tlula yimbirhi kusuka eka lowutsongo eka hinkwayo kufika eka lowukulu eka hinkwayo na kusuka eka lowukulu eka hinkwayo kufika eka lowutsongo eka hinkwayo Yo tala na yingariyingani, xik. ku phokotela loku nga kunguhateriwangiki, nkarhi wa swinambunambu, ku avelana switirhisiwa	Fananisa leswaku hi yihi ya mihlengelo leyi nyikiweke yimbirhi ya michumu yi nga: - yikulu, yitsongo - yikulunyana, yitsongonyana - yikulu kutlula hinkwayo, yitsongo kutlula hinkwayo Ntsongo kutlula, hansi kutlula, ringana na Yo tala na yingariyingani, xik. ku phokotela loku nga kunguhateriwangiki	Ntsongo kutlula, hansi kutlula, ringana na Yo tala na yingariyingani Vutisa swivutiso: 'Hi swihi a swi tele/a swi ri switsongo?'	Ntsongo kutlula, hansi kutlula, ringana na Yo tala na yingariyingani Vutisa swivutiso: 'Hi swihi a swi tele/a swi ri switsongo?'
			Endla mitlawa yo ringana (tisete) ya michumu, xik. vana kumbe michumu leyi nga ekamareni ro dyondzela	Tirhisa michumu ku endla mitlawa yo ringana (tisete)	Tirhisa michumu ku endla mitlawa yo ringana (tisete)
		Ku tlhantlha na ku vumba mihlengelo ya 2 na 3, xik. 3 swi nga va: 1 na 1 na 1 KUMBE 2 na 1 KUMBE 1 na 2 KUMBE a hi nchumu (ziro) na 3	Ku tlhantlha na ku vumba mihlengelo ya 4 na 5, xik. 4 swi nga va: 1 na 1 na 1 na 1 KUMBE 3 na 1 KUMBE 2 na 2 KUMBE a hi nchumu (ziro) na 4	Tirhisa swilawuriwa ku lavisisa na ku tumbuluxa maqhinga ya ku tlhantlha na ku aka mihlengelo kufika eka 8	Tirhisa swilawuriwa ku lavisisa na ku tumbuluxa maqhinga ya ku tlhantlha na ku aka mihlengelo kufika eka 10
	Xaxameta (longoloxa) tinomboro	Xaxameta mihlengelo yo tlula yimbirhi eka leyi nyikiweke kusuka eka lowutsongo eka hinkwayo kufika eka lowukulu eka hinkwayo na kusuka eka lowukulu eka hinkwayo kufika eka lowutsongo eka hinkwayo	Xaxameta mihlengelo yo tlula yimbirhi eka leyi nyikiweke kusuka eka lowutsongo eka hinkwayo kufika eka lowukulu eka hinkwayo na kusuka eka lowukulu eka hinkwayo kufika eka lowutsongo eka hinkwayo	Xaxameta mihlengelo ya michumu kusuka eka leyitsongo eka hinkwayo kufika eka leyikulu eka hinkwayo na kusuka eka leyikulu eka hinkwayo ku fika eka leyitsongo eka hinkwayo	Xaxameta mihlengelo ya michumu kusuka eka leyitsongo eka hinkwayo kufika eka leyikulu eka hinkwayo na kusuka eka leyikulu eka hinkwayo ku fika eka leyitsongo eka hinkwayo Pananisa khadi ra mifungho ya tinomboro eka mihlengelo
		Xaxameto wa tinimboro lowu nga kunguhariwangiki 'Xana hi yihi leyi landzelaka, endzhaku ka, exikarhi ka': - layini/mugiva wa tinomboro - xiporo kumbe lerha ra tinomboro - makhadi ya tinomboro	Veka mifungho ya tinomboro hi xaxamelo wo hlayela lowu nga lulama 'Xana hi yihi leyi landzelaka, endzhaku ka, exikarhi ka': - layini/mugiva wa tinomboro - xiporo kumbe lerha ra tinomboro - makhadi ya tinomboro	Veka mifungho ya tinomboro hi xaxamlo wo hlayela lowu nga lulama 'Xana hi yihi leyi landzelaka, endzhaku ka, exikarhi ka': - layini/mugiva wa tinomboro - xiporo kumbe lerha ra tinomboro - makhadi ya tinomboro	A swi kunguhatiwangi: Vunavi bya tinomboro: 0–10 Veka mifungho ya tinomboro hi xaxamelo wo hlayela lowu nga lulama 'Xana hi yihi leyi landzelaka, endzhaku ka, exikarhi ka': - layini/mugiva wa tinomboro - xiporo kumbe lerha ra tinomboro - makhadi ya tinomboro

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
	Ordinal numbers	Incidentally develop an awareness of first, second, third … last, next Introduce during: - refreshment/snack time and toilet routine - in everyday contexts, across subjects, lining up, e.g. 'Who was first/ last/second to come in the door'	Incidentally develop an awareness of first, second, third, fourth, last, next In everyday contexts: daily routine – lining up, snack time, toilet routine Integrate: Life Skills, physical development and art activities (where appropriate), outdoor activities, e.g. races Line up objects or manipulatives and discuss position	Incidentally develop an awareness of first, second, third, fourth, fifth, last, next Reinforce ordinal numbers in the daily routine and integrate during the day and in outdoor activities, e.g. races Place learners and objects in a row and identify ordinal position in one direction, e.g. left to right	Incidentally develop an awareness of first, second, third, fourth, fifth, sixth, last, next Reinforce ordinal numbers in the daily routine and integrate during the day and in outdoor activities, e.g. races Place learners and objects in a row and identify ordinal position in both directions, e.g. left to right and right to left
1.5	**Place value**	No CAPS content for Grade R (focus on number concept of numbers 1–9 and zero, 1.1 and 1.4)			
SOLVE PROBLEMS IN CONTEXT					
1.6	**Problem-solving techniques**	**Number range: 1–3** Solve problems in everyday contexts Uses the following techniques: - concrete apparatus, e.g. counters - counting all in ones	**Number range: 1–5** Solve problems in everyday contexts Uses the following techniques: - concrete apparatus, e.g. counters - physical number ladder - ten structure beads - counting all in ones Number range: 1–4	**Number range: 1–8** Solve problems in everyday contexts Uses the following techniques: - concrete apparatus, e.g. counters - physical number ladder - ten structure beads - counting all in ones - counting on Number range: 1–7	**Number range: 0–10** Solve problems in everyday contexts Uses the following techniques: - concrete apparatus, e.g. counters - physical number ladder - ten structure beads - counting all in ones - counting on Number range: 0–10
1.7	**Addition and subtraction** Orally solve word problems (story sums) and explain own solutions to problems involving addition and subtraction with answers up to 10	Investigate addition and subtraction in everyday activities through the use of manipulatives and stories Orally solve problems that involve numbers 1–3 using counters, stories, pictures	Orally solve problems that involve numbers 1–5 using objects, stories, pictures Use counters and orally solve problems that involve the numbers 2, 3 and 4 Reinforce the solving of problems that involve numbers 1 to 4	Orally solve problems that involve numbers 1–8 using objects, stories, pictures Introduce terminology (add to/add, take away/ subtract) Use counters and orally solve problems that involve the numbers 5, 6 and 7 Reinforce the solving of problems that involve numbers 1 to 7	Orally solve problems that involve numbers 0–10 using objects, stories and pictures Use terminology (add and subtract) Use counters and orally solve problems that involve the numbers 8, 9 and 10 Reinforce the solving of problems that involve numbers 1 to 10
1.8	**Repeated addition leading to multiplication**	No CAPS content for Grade R			

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
	Tinomboro ta odinali	Tumbuluxa swi nga kunguhatiwangi vulemukisi bya vun'we, vumbirhi, vunharhu … hetelela, landzelaka Tivisa eka: - nkarhi wa swakudya/ swinambunambu na nkarhi wa ku ya exihambukelweni - eka mivangu ya masiku hinkwawo, eka tidyondzo hinkwato ku fola, xik. 'A ku ri mani wa vun'we/wo hetelela/ wa vumbirhi ku nghena enyangweni'	Tumbuluxa swi nga kunguhatiwangi vulemukisi bya vun'we, vumbirhi, vunharhu, vumune, hetelela, landzelaka Eka mivangu ya masiku hinkwawo: migingiriko ya siku na siku – ku fola, nkarhi wa swinambunambu, nkarhi wa ku ya exihambukelweni Pfanganisa: Swikili swa Vutomi, migingiriko ya vutiolori na migingiriko ya vutshila (laha swi faneleke), migingiriko ya le handle ka miako, xik. nsiyano Folisa michumu kumbe swilawuriwa kutani u kanela xiyimo	Tumbuluxa swi nga kunguhatiwangi vulemukisi bya vun'we, vumbirhi, vunharhu, vumune, vuntlhanu, hetelela, landzelaka Tiyisisa tinomboro ta odinali eka migingiriko ya siku na siku kutani u ti pfanganisa esikwini na le ka migingiriko ya le handle ka miako, xik. nsiyano Veka vadyondzi na michumu hi xaxamelo kutani u kuma xiyimo xa odinali eka tlhelo rin'we, xik. ximatsi kuya exineneni	Tumbuluxa swi nga kunguhatiwangi vulemukisi bya vun'we, vumbirhi, vunharhu, vumune, vuntlhanu, vutsevu, hetelela, landzelaka Tiyisisa tinomboro ta odinali eka migingiriko ya siku na siku kutani u ti pfanganisa esikwini na le ka migingiriko ya le handle ka miako, xik. nsiyano Veka vadyondzi na michumu hi xaxamelo kutani u kuma xiyimo xa odinali eka matlhelo hamambirhi, xik. ximatsi kuya exineneni na xinene kuya eximatsini
1.5	**Nkoka wa ndhawu ('Vukulu bya dijiti')**	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (kongomisa eka nongoti wa tinomboro wa tinomboro ta 1–9 na ziro, 1.1 na 1.4)			
OLOLOXA SWIPHIQO EKA MBANGU					
1.6	**Tithekiniki ta ku ololoxa swiphiqo**	**Vunavi bya tinomboro: 1–3** Ololoxa swiphiqo eka mivangu ya masiku hinkwawo Tirhisa tithekiniki leti landzelaka: - switirhisiwa swo khomeka, xik. swo hlayela - ku hlayela hinkwaswo hi va n'we	**Vunavi bya tinomboro: 1–5** Ololoxa swiphiqo eka mivangu ya masiku hinkwawo Tirhisa tithekiniki leti landzelaka: - switirhisiwa swo khomeka, xik. swo hlayela - lerha ra tinomboro ro khomeka - khume ra vuhlalu bya xivumbeko - ku hlayela hinkwaswo hi va n'we Vunavi bya tinomboro: 1–4	**Vunavi bya tinomboro: 1–8** Ololoxa swiphiqo eka mivangu ya masiku hinkwawo Tirhisa tithekiniki leti landzelaka: - switirhisiwa swo khomeka, xik. swo hlayela - lerha ra tinomboro ro khomeka - khume ra vuhlalu bya xivumbeko - ku hlayela hinkwaswo hi va n'we - ku hlayela kuya emahlweni Vunavi bya tinomboro: 1–7	**Vunavi bya tinomboro: 0–10** Ololoxa swiphiqo eka mivangu ya masiku hinkwawo Tirhisa tithekiniki leti landzelaka: - switirhisiwa swo khomeka, xik. swo hlayela - lerha ra tinomboro ro khomeka - khume ra vuhlalu bya xivumbeko - ku hlayela hinkwaswo hi va n'we - ku hlayela kuya emahlweni Vunavi bya tinomboro: 0–10
1.7	**Ku hlanganisa na ku susa** Ololoxa hi ku vulavula swiphiqo swa marito (tinhlayo ta switori) kutani u hlamusela switshunxo swa wena n'wini swa swiphiqo leswi khumbaka ku hlanganisa na ku susa leswi nga na tinhlamulo kufika eka 10	Lavisisa ku hlanganisa na ku susa eka migingiriko ya masiku hinkwawo hi ku tirhisa swilawuriwa na switori Ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 1–3 hi ku tirhisa swo hlayela, switori, swifaniso	Ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 1–5 hi ku tirhisa michumu, switori, swifaniso Tirhisa swo hlayela kutani u ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 2, 3 na 4 Tiyisisa ku ololoxiwa ka swiphiqo leswi swi khumbaka tinomboro ta 1 kufika eka 4	Ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 1–8 hi ku tirhisa michumu, switori, swifaniso Tivisa theminoloji (hlanganisa eka/ hlanganisa, teka/susa) Tirhisa swo hlayela kutani u ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 5, 6 na 7 Tiyisisa ku ololoxiwa ka swiphiqo leswi swi khumbaka tinomboro ta 1 kufika eka 7	Ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 0–10 hi ku tirhisa michumu, switori, swifaniso Tivisa theminoloji (hlanganisa na susa) Tirhisa swo hlayela kutani u ololoxa hi ku vulavula swiphiqo leswi swi khumbaka tinomboro ta 8, 9 na 10 Tiyisisa ku ololoxiwa ka swiphiqo leswi swi khumbaka tinomboro ta 1 kufika eka 10
1.8	**Ku hlanganisa ko vuyelela loku yisaka eka ku andzisa**	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V			

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
1.9	**Grouping and sharing leading to division (equal sharing and grouping with whole numbers up to 10 with answers that incl. remainders)**	Introduce concept of equal sharing: - during daily activities - stories and pictures - one-to-one sharing	Equal sharing: - during daily activities - stories and pictures - one-to-one sharing	Equal sharing: - grouping - half - use concrete objects	Equal sharing: - grouping - half and double - use concrete objects
1.10	**Sharing leading to fractions**	No CAPS content for Grade R (focus on problem solving with remainders that can be shared, 1.9)			
1.11	**Money**		Develop an awareness of South African coins: 10c, 20c, 50c, R1, R2, R5 Identify colour and animals Identify similarities and differences Sort play money according to colour and size Provide play money in the house corner	Develop an awareness of South African bank notes: R10, R20, R50, R100, R200 Identify similarities and differences between notes Sort play money according to colour and size Provide play money in the house corner	Provide play money in the house corner
CONTEXT-FREE CALCULATIONS: OPERATIONS					
1.12	**Techniques**	No CAPS content for Grade R (focus on counting all and counting on, 1.1 and 1.6)			
1.13	**Addition and subtraction: solves verbally-stated addition and subtraction problems**		Number range: 1–5 Orally solves addition and subtraction problems with solutions up to 5 Number range: 1–4	Number range: 1–8 Orally solves addition and subtraction problems with solutions up to 8 Number range: 1–7	Number range: 1–10 Orally solves addition and subtraction problems with solutions up to 10 Number range: 1–10
1.14	**Repeated addition leading to multiplication**	No CAPS content for Grade R			
1.15	**Division**	No CAPS content for Grade R (focus on equal sharing, 1.9)			
1.16	**Mental maths**	Begin each whole class and teacher-guided activity with mental maths and do mental maths where incidental learning opportunities arise Counting everyday objects Counting forwards and backwards Ordinal counting Estimating Problem solving Memory games			
1.17	**Fractions**	No CAPS content for Grade R (focus on equal sharing, 1.9)			

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
1.9	Ku ntlawahata na ku avelana leswi yisaka eka ku avanyisa (ku avelana ko ringana na ku ntlawahata ko ringana hi tinomboroxiheri kufika eka 10 leti nga na tinhlamulo leti katsaka misalo)	Tivisa nongoti wa ku avelana ko ringana: - hi nkarhi wa migingiriko ya siku na siku - switori na swifaniso - ku avelana ka xin'we-eka-xin'we	Ku avelana ko ringana: - hi nkarhi wa migingiriko ya siku na siku - switori na swifaniso - ku avelana ka xin'we-eka-xin'we	Ku avelana ko ringana: - ku ntlawahata - hafu - tirhisa michumu yo khomeka	Ku avelana ko ringana: - ku ntlawahata - hafu na mbirhihato - tirhisa michumu yo khomeka
1.10	Ku avelana loku yisaka eka tifurakixini	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (kongomisa eka ku ololoxa swiphiqo leswi nga na misalo leswi nga avelaniwaka, 1.9)			
1.11	Mali		Tumbuluxa vulemukisi bya swingwece swa Afrika-Dzonga: 10c, 20c, 50c, R1, R2, R5 Kuma muhlovo na swiharhi Kuma ku fanana na ku hambana Ava mali yo tlangisa hi ku ya hi muhlovo na sayizi Nyika yindlu ya le khoneni mali yo tlangisa	Tumbuluxa vulemukisi bya mali ya phepha ya bangi ya Afrika-Dzonga: R10, R20, R50, R100, R200 Kuma ku fanana na ku hambana exikarhi ka timali ta phepha Ava mali yo tlangisa hi ku ya hi muhlovo na sayizi Nyika yindlu ya le khoneni mali yo tlangisa	Nyika yindlu ya le khoneni mali yo tlangisa
MIKHAKULETO YI NGA YIKI HI MBANGU: TIOPAREXINI					
1.12	Tithekiniki	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (nkongomo wu le ka ku hlayela hinkwaswo na ku hlayela kuya emahlweni, 1.1 na 1.6)			
1.13	Ku hlanganisa na ku susa: ololoxa hi nomu swiphiqo swa ku hlanganisa na ku susa leswi vuriweke		Vunavi bya tinomboro: 1–5 Ololoxa hi nomu swiphiqo swa ku hlanganisa na ku susa leswi nga na switshunxo kufika eka 5 Vunavi bya tinomboro: 1–4	Vunavi bya tinomboro: 1–8 Ololoxa hi nomu swiphiqo swa ku hlanganisa na ku susa leswi nga na switshunxo kufika eka 8 Vunavi bya tinomboro: 1–7	Vunavi bya tinomboro: 1–10 Ololoxa hi nomu swiphiqo swa ku hlanganisa na ku susa leswi nga na switshunxo kufika eka 10 Vunavi bya tinomboro: 1–10
1.14	Ku hlanganisa ko vuyelela loku yisaka eka ku andzisa	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V			
1.15	Ku avanyisa	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (kongomisa eka ku avelana ko ringana, 1.9)			
1.16	Menthele wa tinhlayo	Sungula nghingiriko wun'wana na wun'wana wa tlilasi hinkwayo na lowu leteriwaka hi mudyondzisi hi menthele wa tinhlayo u tlhela u endla menthele wa tinhlayo laha swivandlanene swa ku dyondza loku nga kunguhatiwangiki swi humelelaka kona Ku hlayela michumu ya masiku hinkwawo Ku hlayela kuya emahlweni na le ndzhaku Ku hlayela ka odinali Ku kumbetela Ku ololoxa swiphiqo Mitlangu yo bela enhlokweni			
1.17	Tifurakixini	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (nkongomo wu le ka ku avelana ko ringana, 1.9)			

2. PATTERNS, FUNCTIONS and ALGEBRA					
	TOPIC	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**
2.1 GEOMETRIC PATTERNS					
Identify patterns		Identify patterns in familiar everyday environment, e.g. clothes, objects and environment Recognise the 'repeat' in patterns			
Copy and extend simple repeating patterns using physical objects and drawings		Copy and complete patterns Copy patterns using body percussion Copy, complete and create own patterns Introduce language: What comes next? What comes before? How is it the same? How is it different?	Copy and extend patterns with pictures Copy a given pattern using coins Describe the repeat in patterns Copy a given pattern using 3-D concrete objects and 2-D shapes, coins, beads, etc.	Copy and extend own pattern with pictures Copy vertical and horizontal patterns using concrete objects Extend simple repeating patterns	Copy and extend own patterns with pictures Copy a noise (sound/ auditory) pattern Use physical objects and draw patterns
Creates own repeating patterns		Create own pattern using physical objects, drawings, geometric patterns Explain own pattern (repeating rule): - one colour, two shapes - one shape, two colours	Create own pattern with pictures Explain own pattern (repeating rule): - two colours, two shapes - two shapes, two colours	Create own pattern with pictures Explain own pattern (repeating rule): - three/four colours, different shape, etc.	Create own pattern Explain own pattern (repeating rule): - three/four colours, different shape, etc.
2.1	**Number patterns**	No CAPS content for Grade R (focus on counting: ordering numbers in ones and twos, 1.2)			

2. TIPATIRONI, TIFANKIXINI na ALIJEBURA					
	NHLOKOMHAKA	**KOTARA YA 1**	**KOTARA YA 2**	**KOTARA YA 3**	**KOTARA YA 4**
2.1 TIPATIRONI TA JOMETIRI					
	Kuma tipatironi	Kuma tipatironi ta ntolovelo leti nga eka mbangu wa masiku hinkwawo, xik. swiambalo, michumu na mbangu Lemuka 'mbuyelelo' eka tipatironi			
	Kopunula kutani u ndlandlamuxa tipatironi to vuyelela to olova hi ku tirhisa michumu yo khomeka na swidirowiwa	Kopunula kutani u hetisa tipatironi Kopunula tipatironi hi ku tirhisa mpfumawulo lowu humesiwaka hi swirho swa miri Kopunula, hetisa kutani u tumbuluxa tipatironi ta wena n'wini Tivisa ririmi: I yini lexi landzelaka? I yini lexi rhangaka? Xi fana njhani? Xi hambana njhani?	Kopunula kutani u ndlandlamuxa tipatironi leti nga na swifaniso Kopunula patironi leyi nyikiweke hi ku tirhisa swingwece Hlamusela mbuyelelo eka tipatironi Kopunula patironi leyi nyikiweke hi ku tirhisa michumu yo khomeka ya 3-D na swivumbeko swa 2-D, swingwece, vuhlalu, sw. na sw.	Kopunula kutani u ndlandlamuxa patironi ya wena n'wini leyi nga na swifaniso Kopunula tipatironi to thwixamela henhla na to hingakanya hi ku tirhisa michumu yo khomeka Ndlandlamuxa tipatironi to vuyelela to olova	Kopunula kutani u ndlandlamuxa tipatironi ta wena n'wini leti nga na swifaniso Kopunula patironi ya huwa (mpfumawulo/ yo twiwa) Tirhisa michumu yo khomeka kutani u dirowa tipatironi
	Tumbuluxa tipatironi to vuyelela ta wena n'wini	Tumbuluxa patironi ya wena n'wini hi ku tirhisa michumu yo khomeka, swidirowiwa, tipatironi ta jometiri Hlamusela patironi ya wena n'wini (nawu wo vuyelela): - muhlovo wun'we, swivumbeko swimbirhi - xivumbeko xin'we, mihlovo yimbirhi	Tumbuluxa patironi ya wena n'wini hi swifaniso Hlamusela patironi ya wena n'wini (nawu wo vuyelela): - mihlovo yimbirhi, swivumbeko swimbirhi - swivumbeko swimbirhi, mihlovo yimbirhi	Tumbuluxa patironi ya wena n'wini hi swifaniso Hlamusela patironi ya wena n'wini (nawu wo vuyelela): - mihlovo yinharhu/ya mune, xivumbeko xo hambana, swi. na sw.	Tumbuluxa patironi ya wena n'wini Hlamusela patironi ya wena n'wini (nawu wo vuyelela): - mihlovo yinharhu/ya mune, xivumbeko xo hambana, swi. na sw.
2.1	**Tipatironi ta tinomboro**	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V (kongomisa eka ku hlayela: ku landzelelanisa tinomboro hi van'we na vambirhi, 1.2)			

3. SPACE and SHAPE (GEOMETRY)					
	TOPIC	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**
3.1	**Position, orientation and views** Describes one 3-D object in relation to another (e.g. in front and behind)	Spatial relationships Position of the child in relation to their surroundings Position of two or more objects in relation to the learner: - in front of and behind - on, on top, under, below - in and out, inside and outside - up and down - next to and between	Spatial relationships Position of the child in relation to their surroundings Position of two or more objects in relation to the learner: - on and under - on top of and underneath - in front of and behind	Spatial relationships Position of two or more objects in relation to each other and to one another: - in front of and behind - on, on top, under, bottom and below - next to - middle - left and right - pegboard work Describe objects from different perspectives, e.g. a doll house from the front, the back, the side depending on where you stand	Spatial relationships Position of two or more objects in relation to each other and to the learners and in relation to one another: - in front of and behind - on top of, under, above, below - top and bottom - next to, between and middle - left and right The position of two or more objects in relation to each other
	Follow directions (alone and/or as a member of a group or team) to move/ place self within a specific space (directionality)	Directionality – forwards and backwards Up and down Games such as tracking the train Obstacle course – following a direction Physical Education and music	Directionality – forwards and backwards Obstacle course – following a direction Outdoor activities Incidental: left and right	Forwards and backwards Arrow chart Left and right	Forwards and backwards Up and down Upwards and downwards Left and right Where does the sound come from?
3.2	**3-D objects**				
	Recognise, identify and name three-dimensional objects in the classroom	Introduce and explore Compare and sort: - balls - boxes with square and rectangular faces (sides)			

3. NDHAWU na XIVUMBEKO (JOMETIRI)					
	NHLOKOMHAKA	**KOTARA YA 1**	**KOTARA YA 2**	**KOTARA YA 3**	**KOTARA YA 4**
3.1	**Xiyimo, ndzetelo na matlhelo** Hlamusela nchumu wun'we wa 3-D hi ku wu yelanisa na wun'wana (xik. emahlweni na endzhaku)	Vuxaka bya ndhawu Xiyimo xa n'wana hi ku yelanisiwa na swivandla swa le kusuhi Xiyimo xa michumu yimbirhi kumbe kutlula yi yelanisiwa na mudyondzi: - emahlweni ka na endzhaku ka - eka, ehenhla, ehansi, laha hansi - endzeni na ehandle, endzeni ka na ehandle ka - ehenhla na ehansi - ekusuhi na na exikarhi ka	Vuxaka bya ndhawu Xiyimo xa n'wana hi ku yelanisiwa na swivandla swa le kusuhi Xiyimo xa michumu yimbirhi kumbe kutlula yi yelanisiwa na mudyondzi: - ehenhla na ehansi - ehenhla ka na ehansi ka - emahlweni ka na endzhaku ka	Vuxaka bya ndhawu Xiyimo xa michumu yimbirhi kumbe kutlula yi yelanisiwa na yona vini na yin'wana: - emahlweni ka na endzhaku ka - eka, ehenhla, ehansi, ehansi ka na laha hansi - ekusuhi na - exikarhi - ximatsi na xinene - ntirho wa phegibodo Hlamusela michumu kusuka eka mavonelo yo hambanahambana, xik. thumbana kusuka emahlweni, endzhaku, etlhelo swi ri karhi swi lawuriwa hi laha u nga yima kona	Vuxaka bya ndhawu Xiyimo xa michumu yimbirhi kumbe kutlula yi yelanisiwa na yona vini na vadyondzi na hi ku yelanisiwa na yin'wana: - emahlweni ka na endzhaku ka - eka, ehenhla ka, ehansi, ehenhla, laha hansi - henhla na hansi - ekusuhi na na exikarhi ka na xikarhi - ximatsi na xinene Xiyimo xa michumu yimbirhi kumbe kutlula hi ku yelanisiwa na yona vini
	Landzelela matlhelo (u ri wexe na/kumbe tanihi xirho xa xipano kumbe ntlawa) tifambisi/tiveki endhawini (tlhelo) yo karhi	Tlhelo – emahlweni na endzhaku Ehenhla na ehansi Mitlangu yo tanihi ku landzelerisa xitimela Ntlangu wa swihingakanyo – ku landzelela xitimela Dyondzo ya Vutiolori na vuyimbeleri	Tlhelo – emahlweni na endzhaku Ntlangu wa swihingakanyo – ku landzelela xitimela Migingiriko ya le handle ka miako Leswi nga kunguhatiwangiki: ximatsi na xinene	Emahlweni na endzhaku Chati ya miseve Ximatsi na xinene	Emahlweni na endzhaku Ehenhla na ehansi Vuhenhla na vuhansi Ximatsi na xinene Xana mpfumawulo wu huma kwihi?
3.2	**Michumu ya 3-D**				
	Lemuka, kuma kutani u nyika mavito ya michumu ya matlhelo manharhu leyi nga ekamareni ro dyondzela	Tivisa kutani u valanga Fananisa kutani u ava: - tibolo - mabokisi lama nga na swikandza swa xikwere na swa yinhlamune (matlhelo)			

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
	Describe, sort and compare 3-D objects	Introduce Tidy-up chart (sorting toys) Sort 3-D objects according to (one attribute): - size (big/small) - colour - shape Identify and explore 3-D objects: flat, round, square or rectangular shape Objects that roll Objects that slide	Sort 3-D objects according to similarities and differences: - size - colour - shape	Sort 3-D objects according to similarities and differences (two attributes): - size - colour - shape Explore 3-D objects: flat, round, square or rectangular shape	Sort 3-D objects according to (two or more attributes): - size - colour - shape Explore 3-D objects: flat, round, square or rectangular shape
	Build 3-D objects	**Ongoing** Provide building blocks and construction materials during free play inside on a daily basis Explore with building blocks	**Ongoing** Provide building blocks and construction materials during free play inside on a daily basis Explore with building blocks Use building blocks and recycled materials to build own constructions	**Ongoing** Provide building blocks and construction materials during free play inside on a daily basis Build own construction by copying from a given construction example Copy the same construction from a design or picture card	**Ongoing** Provide building blocks and construction materials during free play inside on a daily basis Ongoing during free play inside
3.3	**2-D shapes**				
	Recognise, identify and name two-dimensional shapes in the classroom	Introduce Tidy-up/ Helper's chart Recognise learner symbol and name Introduce 2-D shapes: circle, square, triangle, rectangle Puzzles (minimum 6 pieces)	Recognise learner symbol and name Recognise, identify and name 2-D shapes: circle, square and triangle Puzzles (minimum 12 pieces)	Recognise and identify learner name Reinforce: circle, square, triangle Compare rectangles and squares Puzzles (minimum 18 pieces)	Identify learner name Reinforce: rectangle Recognise, identify and name 2-D shapes: circle, square, triangle, rectangle Puzzles (minimum 24 pieces)
	Describe, sort and compare 2-D shapes	Sort 2-D shapes according to: - colour - shape Circle: curved line Square: 4 sides, straight lines, corners Triangle: 3 sides, straight lines, corners	Sort 2-D shapes according to similarities and differences: - shape Reinforce triangle Reinforce circle and square	Sort 2-D shapes according to: - colour - shape (curved line, three or four lines) Reinforce circle, square and triangle	Sort 2-D shapes according to: - size - colour - shape

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
	Hlamusela, ava na ku fananisa michumu ya 3-D	Tivisa Chati ya ku basisa (ava switlangiso) Ava michumu ya 3-D hi ku ya hi (xihlawulekisi xin'we): - sayizi (nkulu/ntsongo) - muhlovo - xivumbeko Kuma na ku valanga michumu ya 3-D: xivumbeko xo patlama, xa xirhendzevutana, xa xikwere kumbe xa yinhlamune Michumu leyi khungulukaka Michumu leyi rhetaka	Ava michumu ya 3-D hi ku ya hi ku fanana na ku hambana: - sayizi - muhlovo - xivumbeko	Ava michumu ya 3-D hi ku ya hi ku fanana na ku hambana (swihlawulekisi swimbirhi): - sayizi - muhlovo - xivumbeko Kuma na ku valanga michumu ya 3-D: xivumbeko xo patlama, xa xirhendzevutana, xa xikwere kumbe xa yinhlamune	Ava michumu ya 3-D hi ku ya hi (swihlawulekisi swimbirhi kumbe kutlula): - sayizi - muhlovo - xivumbeko Kuma na ku valanga michumu ya 3-D: xivumbeko xo patlama, xa xirhendzevutana, xa xikwere kumbe xa yinhlamune
	Aka michumu ya 3-D	**Swi ya emahlweni** Nyika tibuloko to aka na timatheriyali to maka hi nkarhi wo tlanga va tshunxekile endzeni masiku hinkwawo Valanga hi tibuloko to aka	**Swi ya emahlweni** Nyika tibuloko to aka na timatheriyali to maka hi nkarhi wo tlanga va tshunxekile endzeni masiku hinkwawo Valanga hi tibuloko to aka Tirhisa tibuloko to aka na timatheriyali leti vuyelerisiweke ku aka swimakiwa swa wena n'wini	**Swi ya emahlweni** Nyika tibuloko to aka na timatheriyali to maka hi nkarhi wo tlanga va tshunxekile endzeni masiku hinkwawo Aka ximakiwa xa wena n'wini hi ku kopela eka xikombiso xa ximakiwa lexi nyikiweke Kopunula ximakiwa xo fana eka khadi ra xitumbuluxiwa kumbe ra xifaniso	**Swi ya emahlweni** Nyika tibuloko to aka na timatheriyali to maka hi nkarhi wo tlanga va tshunxekile endzeni masiku hinkwawo Swi ya emahlweni hi nkarhi wo tlanga va tshunxekile endzeni
3.3	**Swivumbeko swa 2-D**				
	Lemuka, kuma kutani u nyika mavito ya swivumbeko swimbirhi leswi nga ekamareni ro dyondzela	Tivisa Chati ya ku basisa/Chati ya mupfuni Lemuka mfungho wa mudyondzi na vito Tivisa swivumbeko swa 2-D: xirhendzevutana, xikwere, yinhlanharhu, yinhlamune Swiphazamiso (mpimohansi wa 6 wa swiphemu)	Lemuka mfungho wa mudyondzi na vito Lemuka, kuma na ku nyika mavito ya swivumbeko swa 2-D: xirhendzevutana, xikwere na yinhlanharhu Swiphazamiso (mpimohansi wa 12 wa swiphemu)	Lemuka na ku kuma vito ra mudyondzi Tiyisisa: xirhendzevutana, xikwere, yinhlanharhu Fananisa tinhlamune na swikwere Swiphazamiso (mpimo hansi wa 18 wa swiphemu)	Kuma vito ra mudyondzi Tiyisisa: yinhlamune Lemuka, kuma na ku nyika mavito ya swivumbeko swa 2-D: xirhendzevutana, xikwere, yinhlanharhu, yinhlamune Swiphazamiso (mpimohansi wa 24 wa swiphemu)
	Lemuka, kuma na ku nyika mavito ya swivumbeko swa 2-D	Ava michumu ya 2-D hi ku ya hi: - muhlovo - xivumbeko Xirhendzevutana: ntila wo gombonyoka Xikwere: 4 wa matlhelo, ntila wo thwixama, tikhona Yinhlanharhu: 3 wa matlhelo, ntila wo thwixama, tikhona	Ava michumu ya 2-D hi ku ya hi ku fanana na ku hambana: - xivumbeko Tiyisisa yinhlanharhu Tiyisisa xirhendzevutana na xikwere	Ava michumu ya 2-D hi ku ya hi: - muhlovo - xivumbeko (ntila wo gombonyoka, mitila yinharhu kumbe ya mune) Tiyisisa xirhendzevutana, xikwere na yinhlanharhu	Ava michumu ya 2-D hi ku ya hi: - sayizi - muhlovo - xivumbeko

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
	Figure-ground perception **Geometric shapes**	Introduce figure-ground perception (identify objects and shapes – 'I spy with my little eye') Introduce circle, square and triangle	Reinforce figure-ground perception through sorting, matching and grouping activities and tidy-up routine Reinforce triangle Shape conservation (form constancy of triangle)	Reinforce figure-ground perception through sorting, matching and grouping activities and tidy-up routine Reinforce square Shape conservation (form constancy of shapes learnt to date)	Reinforce figure-ground perception through sorting, matching and grouping activities and tidy-up routine Reinforce circle, triangle, square and rectangle Shape conservation (form constancy of shapes learnt to date)
3.4	**Symmetry (Recognise line of symmetry in self, and own environment)**	Identify body parts Awareness of body in terms of: - one's body has two sides - the one side, the other side, leading to left and right - top/bottom - back/front - crossing midline (physical activities) Activities to be done during physical development – using rhymes and songs, and during Creative Arts	Crossing midline – performing actions Applying crossing the midline during Life Skills (physical development) – using rhymes and songs, and during Creative Arts	Crossing midline (chalkboard activities) Applying crossing the midline during Life Skills (physical development)	Develop an awareness that there is symmetry in objects Applying crossing the midline during Life Skills (physical development)

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
	Ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni **Swivumbeko swa jometiri**	Tivisa ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni (kuma michumu na swivumbeko – 'Ndzi hlometela hi xitihlwana xin'we') Tivisa xirhendzevutana, xikwere na yinhlanharhu	Tiyisa ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni hi ku tirhisa migingiriko yo ava, yo pananisa na yo ntlawahata na nghingiriko wa ku basisa ka siku na siku Tiyisisa yinhlanharhu Ku hlayisa xivumbeko (ku nga cinci ka xivumbeko ka yinhlanharhu)	Tiyisa ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni hi ku tirhisa migingiriko yo ava, yo pananisa na yo ntlawahata na nghingiriko wa ku basisa ka siku na siku Tiyisisa xikwere Ku hlayisa xivumbeko (ku nga cinci ka xivumbeko ka swivumbeko leswi dyondziweke kufika sweswi)	Tiyisa ndzemuko wa swifaniso swa swivumbeko swo ka swi nga ri erivaleni hi ku tirhisa migingiriko yo ava, yo pananisa na yo ntlawahata na nghingiriko wa ku basisa ka siku na siku Tiyisisa xirhendzevutana, yinhlanharhu, xikwere na yinhlamune Ku hlayisa xivumbeko (ku nga cinci ka xivumbeko ka swivumbeko leswi dyondziweke kufika sweswi)
3.4	**Ndzinganiso (Lemuka ntila wa ndzinganiso wa wena n'wini, na wa le ka mbangu wa wena n'wini)**	Kuma swirho swa miri Vulemukisi bya miri hi ku ya hi: - miri wa munhu wu na matlhelo mambirhi - tlhelo rin'we, tlhelo lerin'wana, leswi yisaka eka ximatsi na xinene - henhla/hansi - ndzhaku/mahlweni - ku hingakanya ntila wa le xikarhi (migingiriko ya swirho swa miri) Migingiriko leyi yi fanele ku endliwa hi nkarhi wa migingiriko ya vutiolori – ku tirhisa tirhayimi na tinsimu, na hi nkarhi wa Vutshila byo Tumbuluxa	Ku hingakanya ntila wa le xikarhi – ku endla swiendlo Migingiriko leyi yi fanele ku endliwa hi nkarhi wa Swikili swa Vutomi (migingiriko ya vutiolori) – ku tirhisa tirhayimi na tinsimu, na hi nkarhi wa Vutshila byo Tumbuluxa	Ku hingakanya ntila wa le xikarhi (migingiriko ya le xitsalelweni) Ku tirhisa ku hingakanya ntila wa le xikarhi hi nkarhi wa Swikili swa Vutomi (migingiriko ya vutiolori)	Ku tumbuluxa vulemukisi bya leswaku ku na ndzinganiso eka michumu Ku tirhisa ku hingakanya ntila wa le xikarhi hi nkarhi wa Swikili swa Vutomi (migingiriko ya vutiolori)

4. MEASUREMENT					
	TOPIC	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**
4.1	**Time**	Introduce both concepts day/night, light/dark, morning/ afternoon/night (tonight) Introduce **daily programme** with pictures displayed from left to right and arrow to show the activities as the day progresses Introduce **weather chart** (daily) with name of the day, date and month with song and rhyme, flash cards and display labels and symbols and pictures on a calendar representing the week **Days of the week** (daily) sequence learnt through a song or rhyme Indicate birthdays, outings, special days, holidays during the week Sequence months of the year through a song Develop an awareness of the time concept Introduce **seasons chart** summer, autumn, winter, spring Introduce the **birthday chart** and own age, date of birth (day and month) Develop an awareness of reading direction	**Daily programme** (ongoing) Reinforce the sequencing of recurring events in one day **Weather chart** (daily) with day, date and month song and rhyme, flash cards and display labels, symbols and pictures on a weekly calendar **Days of the week** (ongoing) repeat song or rhyme daily Develop an awareness of what the learner does from the time he/she wakes up until going to school Develop an awareness of what happens between suppertime and bedtime **Birthday chart** continuous whenever a learner has a birthday **Seasons chart** summer, autumn, winter, spring	**Daily programme** (ongoing) Reinforce the sequencing of recurring events in one day **Weather chart** (daily) with day, date and month song and rhyme, flash cards and display labels, symbols and pictures on a weekly calendar **Days of the week** (ongoing) **Seasons chart** (ongoing) **Birthday chart** continuous whenever a learner has a birthday	**Daily programme** (ongoing) Reinforce the sequencing of recurring events in one day **Weather chart** (daily) with day, date and month song and rhyme, flash cards and display labels, symbols and pictures on a weekly calendar **Days of the week** (ongoing) **Seasons chart** (ongoing) **Birthday chart** continuous whenever a learner has a birthday

4. MPIMO					
	NHLOKOMHAKA	**KOTARA YA 1**	**KOTARA YA 2**	**KOTARA YA 3**	**KOTARA YA 4**
4.1	**Nkarhi**	Tivisa havumbirhi bya minongoti ya nhlekanhi/vusiku, ku vonakala/munyama, mixo/nhlekanhi/vusiku (vusiku bya namuntlha) Tivisa **nongonoko wa siku na siku** hi swifaniso leswi kombisiweke kusuka eximatsini kuya exineneni na nseve ku komba migingiriko loko siku ri ri karhi ri famba Tivisa **chati ya ta maxelo** (siku na siku) na vito ra siku, siku na n'hweti hi risimu na rhayimi, na makhadi ya swikombakombana na tilebulu to kombisiwa na mifungho yo kombisiwa na swifaniso swo kombisiwa leswi nga eka khalendara leyi kombisaka vhiki Nongoloko wa **Masiku ya vhiki** (siku na siku) lama dyondziweke hi ku tirhisa risimu kumbe rhayimi Kombisa masiku ya ku velekiwa, ku teka tendzo, masiku yo hlawuleka, tiholideyi evhikini Longoloxa tin'hweti ta lembe hi ku tirhisa risimu Tumbuluxa vulemukisi bya nongoti wa nkarhi Tivisa **chati ya tinguva** ximumu, xixikana, xixika, ximun'wana Tivisa **chati ya masiku ya ku velekiwa** na malembe hi vukhale bya munhu yena n'wini, siku ra ku velekiwa (siku na n'hweti) Tumbuluxa vulemukisi bya ku hlaya matlhelo	**Nongonoko wa siku na siku** (wu ya emahlweni) Tiyisisa malongolokelo ya swiendleko leswi vuyelelaka esikwini **Chati ya ta maxelo** (siku na siku) leyi nga na vito ra siku, risimu na rhayimi ya siku na ya n'hweti, makhadi ya swikombakombana na tilebulu ro kombisiwa, mifungho yo kombisiwa swifaniso swo kombisiwa leswi nga eka khalendara ya vhiki na vhiki **Masiku ya vhiki** (ma ya emahlweni) vuyelela risimu kumbe rhayimi siku na siku Tumbuluxa vulemukisi bya leswi mudyondzi a swi endlaka kusukela hi nkarhi lowu a pfukaka hi wona kufikela loko a ya exikolweni Tumbuluxa vulemukisi bya leswi swi humelelaka exikarhi ka nkarhi wa swakudya swa mpimavayeni na nkarhi wa ku etlela **Chati ya siku ra ku velekiwa** yi ya emahlweni nkarhi wihi na wihi lowu mudyondzi a nga na siku ra ku velekiwa **Chati ya tinguva** ximumu, xixikana, xixika, ximun'wana	**Nongonoko wa siku na siku** (wu ya emahlweni) Tiyisisa malongolokelo ya swiendleko leswi vuyelelaka esikwini rin'we **Chati ya ta maxelo** (siku na siku) leyi nga na vito ra siku, risimu na rhayimi ya siku na ya n'hweti, makhadi ya swikombakombana na tilebulu ro kombisiwa, mifungho yo kombisiwa swifaniso swo kombisiwa leswi nga eka khalendara ya vhiki na vhiki **Masiku ya vhiki** (ma ya emahlweni) **Chati ya tinguva** (yi ya emahlweni) **Chati ya masiku ya ku velekiwa** yi ya emahlweni nkarhi wihi na wihi lowu mudyondzi a nga na siku ra ku velekiwa	**Nongonoko wa siku na siku** (wu ya emahlweni) Tiyisisa malongolokelo ya swiendleko leswi vuyelelaka esikwini rin'we **Chati ya ta maxelo** (siku na siku) leyi nga na vito ra siku, risimu na rhayimi ya siku na ya n'hweti, makhadi ya swikombakombana na tilebulu ro kombisiwa, mifungho yo kombisiwa swifaniso swo kombisiwa leswi nga eka khalendara ya vhiki na vhiki **Masiku ya vhiki** (ma ya emahlweni) **Chati ya tinguva** (yi ya emahlweni) **Chati ya masiku ya ku velekiwa** yi ya emahlweni nkarhi wihi na wihi lowu mudyondzi a nga na siku ra ku velekiwa

	TOPIC	TERM 1	TERM 2	TERM 3	TERM 4
4.2	**Length** Concretely compare and order objects using appropriate vocabulary to describe length	During daily routines introduce the concept of length: long and short, tall, taller and tallest Introduce a height chart Learners can compare their heights against something in the class, e.g. cupboard: - measure with hands (visual and incidental) - measure with footprints/feet	During daily routines explore the concept of length: long and short, tall, taller and tallest Compare and order two or more objects by placing them next to each other Use appropriate vocabulary to describe length: longest and shortest, longer and shorter Height chart comparison: learners discover whether they have grown since last term	Estimate the length of different objects Estimate and measure the length of different objects using feet, hands, a piece of string, a stick Height chart comparison: learners discover whether they have grown since last term	Measure the height of learners with a tape measure Height chart comparison: learners discover whether they have grown since last term
4.3	**Mass** Works concretely comparing and ordering objects using appropriate vocabulary	Incidental learning indoors and outdoors Continuous during water and sand play	Incidental learning indoors and outdoors Continuous during water and sand play	Introduce concept of mass by comparing the masses of different objects: - light/heavy - lighter/heavier - lightest/heaviest	Reinforce the language of mass during indoor and outdoor activities
4.4	**Capacity/Volume** Works concretely comparing and ordering objects using appropriate vocabulary	Incidental learning indoors and outdoors: empty/full, more than, less than Continuous during water and sand play	Incidental learning indoor and outdoor activities Water/sand play Use containers to compare amounts using familiar containers	Introduce the measuring concept of capacity by comparing how much various containers hold: - empty/full - more than/less than	Continuous during water and sand play Reinforce the language of capacity/ volume during indoor and outdoor activities
4.5	**Perimeter and Area**	No CAPS content for Grade R			

	NHLOKOMHAKA	KOTARA YA 1	KOTARA YA 2	KOTARA YA 3	KOTARA YA 4
4.2	**Vulehi** Fananisa na ku xaxameta hi ndlela yo khomeka michumu hi ku tirhisa ntivomarito lowu faneleke ku hlamusela vulehi	Hi nkarhi wa migingiriko ya siku na siku tivisa nongoti wa vulehi: leha na koma, leha, lehanyana na leha kutlula hinkwavo Tivisa chati ya vulehelahenhla Vadyondzi va nga fananisa vulehelahenhla na xin'wana lexi nga etlilasini, xik. khabodo: - pima hi swandla (swo voniwa na leswi nga kunguhatiwangiki) - pima hi migandlankondzo/ nkondzo	Hi nkarhi wa migingiriko ya siku na siku valanga nongoti wa vulehi: leha na koma, leha, lehanyana na leha kutlula hinkwavo Fananisa na ku xaxameta michumu yimbirhi kumbe kutlula hi ku yi veka ekusuhi na kusuhi Tirhisa ntivomarito lowu faneleke ku hlamusela vulehi: leha kutlula hinkwaswo, lehanyana na komanyana Mfananiso wa chati ya vulehelahenhla: vadyondzi va kuma loko kuri va kurile kusuka eka kotara leyi nga hundza	Kumbetela vulehi bya michumu yo hambanahambana Kumbetela na ku pima vulehi bya michumu yo hambanahambana hi ku tirhisa mikondzo, swandla, na njara, rinhi Mfananiso wa chati ya vulehelahenhla: vadyondzi va kuma loko kuri va kurile kusuka eka kotara leyi na hundza	Pima vulehelahenhla bya vadyondzi hi thepi yo pima Mfananiso wa chati ya vulehelahenhla: vadyondzi va kuma loko va kurile kusuka eka kotara leyi na hundza
4.3	**Ntiko** Tirha hi ndlela yo khomeka u ri karhi u fananisa na ku xaxameta michumu hi ku tirhisa ntivomarito lowu faneleke	Ku dyondza loku nga kunguhatiwangiki ka le ndzeni ka miako na le handle ka miako Swi ya emahlweni hi nkarhi wo tlanga hi mati na hi misava	Ku dyondza loku nga kunguhatiwangiki ka le ndzeni ka miako na le handle ka miako Swi ya emahlweni hi nkarhi wo tlanga hi mati na hi misava	Tivisa nongoti wa ntiko hi ku fananisa mitiko ya michumu yo hambanahambana: - vevuka/tika - vevukanyana/ tikanyana - vevuka kutlula hinkwaswo/tika kutlula hinkwaswo	Tiyisisa ririmi ra ntiko hi nkarhi wa migingiriko ya le ndzeni ka miako na ya le handle ka miako
4.4	**Vundzeni/Vholumu** Tirha hi ndlela yo khomeka u ri karhi u fananisa na ku xaxameta michumu hi ku tirhisa ntivomarito lowu faneleke	Ku dyondza loku nga kunguhatiwangiki ka migingiriko ya le ndzeni ka miako na le handle ka miako: hava nchumu/tele, tele kutlula, ntsongo kutlula Swi ya emahlweni hi nkarhi wo tlanga hi mati na hi misava	Ku dyondza loku nga kunguhatiwangiki ka migingiriko ya le ndzeni ka miako na le handle ka miako Ku tlanga hi mati/ misava Tirhisa tikhontheni ku fananisa ntalo hi ku tirhisa tikhontheni leti nga toloveleka	Tivisa nongoti wo pima wa vundzeni hi ku fananisa leswaku i swo tala kufika kwihi tikhontheni to hambanahambana ti swi khomaka: - hava nchumu/tele - tele kutlula/ntsongo kutlula	Swi ya emahlweni hi nkarhi wo tlanga hi mati na hi misava Tiyisisa ririmi ra vundzeni/vholomu hi nkarhi wa migingiriko ya le ndzeni ka miako na ya le handle ka miako
4.5	**Pherimitara na Ndhawu**	A ku na vundzeni bya XIPHOKHAMA bya Giredi ya V			

5. DATA HANDLING					
	TOPIC	**TERM 1**	**TERM 2**	**TERM 3**	**TERM 4**
5.1	**Collect and sort objects** Collect and sort physical objects according to one attribute, e.g. size of leaves	Introduce the concept of data handling: - collect and sort data, e.g. How many boys/girls in the class? - sort the data by letting learners stand in a boy/girl row	Collect objects (twigs of different sizes/ lengths) Sort the collected objects (twigs)	Pose a question: 'Are names with six letters the most popular?' Collect data to answer the question using the learners' name cards Sort the name cards according to the number of letters in each name	Collect data: Whose birthdays are in which month? Sort the data according to the relevant birthday month of each learner Collect data: e.g. What is your favourite playdough colour? Select one block representing the colour of his/her choice of playdough for the week Collect data: Which mode of transport do learners use to come to school? Sort the collected data (walk, with parent's car, taxi or bus)
5.2	**Represent sorted collections of objects**	Represent the graph using concrete objects Make a graph representing the data using blocks or shapes Make a pictograph	Draw a graph to display data (twigs) Draw a picture as a record of collected objects	Draw a graph by pasting each name card below the relevant column Make a pictograph	Draw a graph representing the learners' birthdays in each month Use real objects to make a graph, such as blocks to represent the colour of playdough you plan to make, e.g. blue, yellow, green Draw a pictograph representing the learners who walk and come by taxi, car, bus
5.3	**Discuss and report on sorted collections of objects**	Read and interpret data by using playdough to make a representation of the number of boys and girls in the class Answer questions based on own sorting of objects How many big leaves did you draw? Which are the most: the big leaves or the small leaves? How many/more/ less/same as?	Read and interpret graphs using questions Answer questions based on own picture or own sorted objects	Read and interpret data by counting the number cards in each column and coming to a conclusion	Read and interpret graphs using questions to determine which month has the most birthdays According to the choice of the learners, the colour of the playdough for the week will be, for example, yellow Read and interpret graphs (How many walk, come by taxi, bus, etc.?)

5. MATIRHISELO YA VUXOKOXOKO BYA TINHLAYO					
	NHLOKOMHAKA	**KOTARA YA 1**	**KOTARA YA 2**	**KOTARA YA 3**	**KOTARA YA 4**
5.1	**Hlengeleta na ku ava michumu** Hlengeleta na ku ava michumu yo khomeka hi ku ya hi xihlawulekisi xin'we, xik. sayizi ya matluka	Tivisa nongoti wa matirhiselo ya vuxokoxoko bya tinhlayo: - hlengeleta na ku ava vuxokoxoko bya tinhlayo, xik. Xana i vafana/ vanhwanyana vangani lava nga etlilasini? - ava vuxokoxoko bya tinhlayo hi ku endla vadyondzi va yima hi nxaxamelo wa vafana/ vanhwanyana	Hlengeleta michumu (swirhabyana swa tisayizi/vulehi byo hambanahambana) Ava michumu leyi hlengeletiweke (swirhabyana)	Vutisa xivutiso: 'Xana mavito lama nga na tsevu wa maletere hi wona yo tiveka ngopfu?' Hlengeleta vuxokoxoko bya tinhlayo ku hlamula xivutiso hi ku tirhisa makhadi ya mavito ya vadyondzi Ava mavito ya makhadi hi ku ya hi nhlayo ya maletere lama nga eka vito rin'wana na rin'wana	Hlengeleta vuxokoxoko bya tinhlayo: Xana i masiku ya ku velekiwa ya vamani lama ma nga eka tin'hweti tihi? Ava vuxokoxoko bya tinhlayo hi ku ya hi n'hweti ya masiku ya ku velekiwa lama fambelanaka na mudyondzi un'wana na un'wana Hlengeleta vuxokoxoko bya tinhlayo: xik. Xana hi wihi muhlovo wa wena wa xirhandzwa wa vumba ro tlangisa? Hlawula buloko yin'we leyi yimelaka muhlovo wa nhlawulo wa yela wa vumba ro tlangisa ra vhiki leri Hlengeleta vuxokoxoko bya tinhlayo: Hi wihi muxaka wa vutleketli lowu vadyondzi va wu tirhisaka ku exikolweni? Ava vuxokoxoko bya tinhlayo lebyi hlengeletiweke (ku famba hi milenge, hi movha wa vatswari, thekisi kumbe bazi)
5.2	**Endla vuyimeri bya mihlengelo ya michumu leyi aviweke**	Endla vuyimeri bya girafu hi ku tirhisa michumu yo khomeka Endla girafu leyi yimelaka vuxokoxoko bya tinhlayo hi ku tirhisa tibuloko kumbe swivumbeko Endla phikitogirafu	Dirowa girafu leyi kombisaka vuxokoxoko bya tinhlayo (swirhabyana) Dirowa xifaniso tanihi rhekodo ya michumu leyi hlengeletiweke	Dirowa girafu hi ku namarheta khadi ra vito rin'wana na rin'wana ehansi ka kholomu leyi faneleke Endla phikitogirafu	Dirowa girafu leyi yimelaka masiku ya ku velekiwa ya vadyondzi lama nga eka n'hweti yin'wana na yin'wana Tirhisa michumu ya xiviri ku endla girafu, yo tanihi tibuloko ku yimela muhlovo wa vumba ro tlangisa lowu u kunguhataka ku wu endla, xik. wasi, xitshopana, rihlaza Dirowa phikitogirafu leyi yimelaka vadyondzi lava va fambaka hi milenge na lava va taka hi thekisi, movha, bazi
5.3	**Kanela na ku vika hi ta mihlengelo ya michumu leyi aviweke**	Hlaya na ku humesa nhlamuselo eka vuxokoxoko bya tinhlayo hi ku tirhisa vumba ro tlangisa ku endla vuyimeri bya nhlayo ya vafana na ya vanhwanyana lava nga etlilasini Hlamula swivutiso hi ku ya hi maavelo ya wena n'wini ya michumu Xana i matluka mangani lamakulu lama u ma diroweke? Xana hi wahi lama nga tala kutla hinkwawo: matluka lamakulu kumbe matluka lamatsongo? I mangani/ma tele/ matsongo/ma fana na?	Hlaya na ku humesa nhlamuselo eka tigirafu hi ku tirhisa swivutiso Hlamula swivutiso hi ku ya hi xifaniso xa wena n'wini kumbe michumu ya wena n'wini leyi aviweke	Hlaya na ku humesa nhlamuselo ya vuxokoxoko bya tinhlayo hi ku hlayela makhadi ya tinomboro lama nga eka kholomu yin'wana na yin'wana kutani u fika emahetelelen	Hlaya na ku humesa nhlamuselo hi ku tirhisa swivutiso ku boha leswaku i n'hweti yihi yi nga na masiku ya ku velekiwa yo tala kutlula hinkwawo Hi ku ya hi nhlawulo wa vadyondzi, muhlovo wa vumba ro tlangisa wa vhiki wu ta va, tanihi xikombiso, xitshopana Hlaya na ku humesa nhlamuselo eka tigirafu (Xana i vangani va fambaka hi milenge, va taka hi thekisi, bazi, swi. na sw.?)

Numbers, Operations and Relationships

Understanding number

Children develop a sense of number and counting through their everyday experiences. They use these to begin to make connections between the different meanings of number. They discover that numbers can be used differently in different situations. For example, 'five' can be used:

- to express an amount ('how muchness'): 'I have five sweets.'
- to express the order of things: 'She is the fifth person in the row.'
- as a measure: 'He is five years old.'
- as a label: 'We live at number five.'
- in a calculation: '2 + 3 = 5'

Numbers are ideas or concepts of quantity (how much). Learners begin to understand that 'five' means that there are five of something, and that five can be the fifth position in a row, or 'five' can tell us how many things there are. Numbers communicate specific, detailed information about collections and quantities of objects, events or actions.

Figure 4.2 Different meanings of 'five'

Numbers are abstract concepts. They are not objects themselves. They describe something about other objects. For example, just like the word 'green' can be used to describe the colour of an apple, the number 'six' can be used to describe the number of apples in a collection. If someone asks you to give them a plate you can hand them the physical object, but if someone asks you to give them 'five' you can't pick that up and

Tinomboro, Tioparexini na Vuxaka

Ku twisisa nomboro

Vana va kurisa ntwisiso wa nomboro na ku hlayela hi ku tirhisa mitokoto ya vona ya masiku hinkwawo. Va tirhisa leswi ku sungula ku endla vuxaka exikarhi ka tinhlamuselo to hambanahambana ta nomboro. Va thumba leswaku tinomboro ti nga tirhisiwa hi tindlela to hambana eka swiyimo swo hambanahambana. Tanihi xikombiso, 'ntlhanu' yi nga tirhisiwa:

- ku komba ntalo ('swi tele kufika kwihi'): 'Ndzi na ntlhanu wa swiwitsi.'
- ku komba malongolokelo ya swilo: 'I munhu wa vuntlhanu eka nxaxamelo.'
- tanihi mpimo: 'U na ntlhanu wa malembe hi vukhale.'
- tanihi mfungho: 'Hi tshama eka nomboro ya ntlhanu.'
- eka nkhakhuleto: '2 + 3 = 5'

Tinomboro i mianakanyo kumbe minongoti ya ntalo (swi tele kufika kwihi). Vadyondzi va sungula ku twisisa leswaku 'ntlhanu' swi vula leswaku ku na ntlhanu wa swin'wana, na leswaku ntlhanu yi nga va eka xiyimo xa vuntlhanu eka nxaxamelo, kumbe 'ntlhanu' yi nga hi byela leswaku ku na swilo swingani swi nga kona. Tinomboro ti vulavula vuxokoxoko lebyi koxometiweke, byo kongoma hi mayelana na mihlengelo na mitalo ya michumu, swiendleko kumbe swiendlo.

Xifaniso xa 42 Tinhlamuselo to hambanahambana ta 'ntlhanu'

Tinomboro i minongoti yo anakanyiwa. Tona hi toxe a hi michumu. Ti hlamusela swin'wana hi mayelana na michumu yin'wana. Tanihi xikombiso, ku fana na rito 'rihlaza' ri nga tirhisiwa ku hlamusela muhlovo wa apula, nomboro ya 'tsevu' yi nga tirhisiwa ku hlamusela nhlayo ya maapula lama nga eka nhlengelo. Loko munhu un'wana a kombela leswaku u n'wi nyika puleti u nga n'wi nyika nchumu wo khomeka, kambe loko munhu un'wana a kombela leswaku u n'wi nyika 'ntlhanu' u nge swi koti ku yi tlakula u n'wi nyiketa yona.

hand it to them. You might think of giving them the numeral '5' written on a card or you might give them five sticks, or show five fingers. It is impossible to show the number itself because it is an idea in our heads, so we find ways of showing or representing the number, such as using a collection of objects, a picture or a symbol, such as a numeral or a word.

In practice ...

Help learners build new maths knowledge and concepts based on their everyday experiences:

- Draw on learners' prior knowledge when introducing new maths concepts.
- Use practical situations to model new maths concepts.
- Make links between everyday activities and concepts.
- Plan activities that build on and deepen learners' understanding of a maths concept.

Figure 43 illustrates a simple progression from everyday activities to more complex concepts of number in Grade R. It starts with everyday activities that have links to numbers and initial number concepts and progresses to more complex concepts of number.

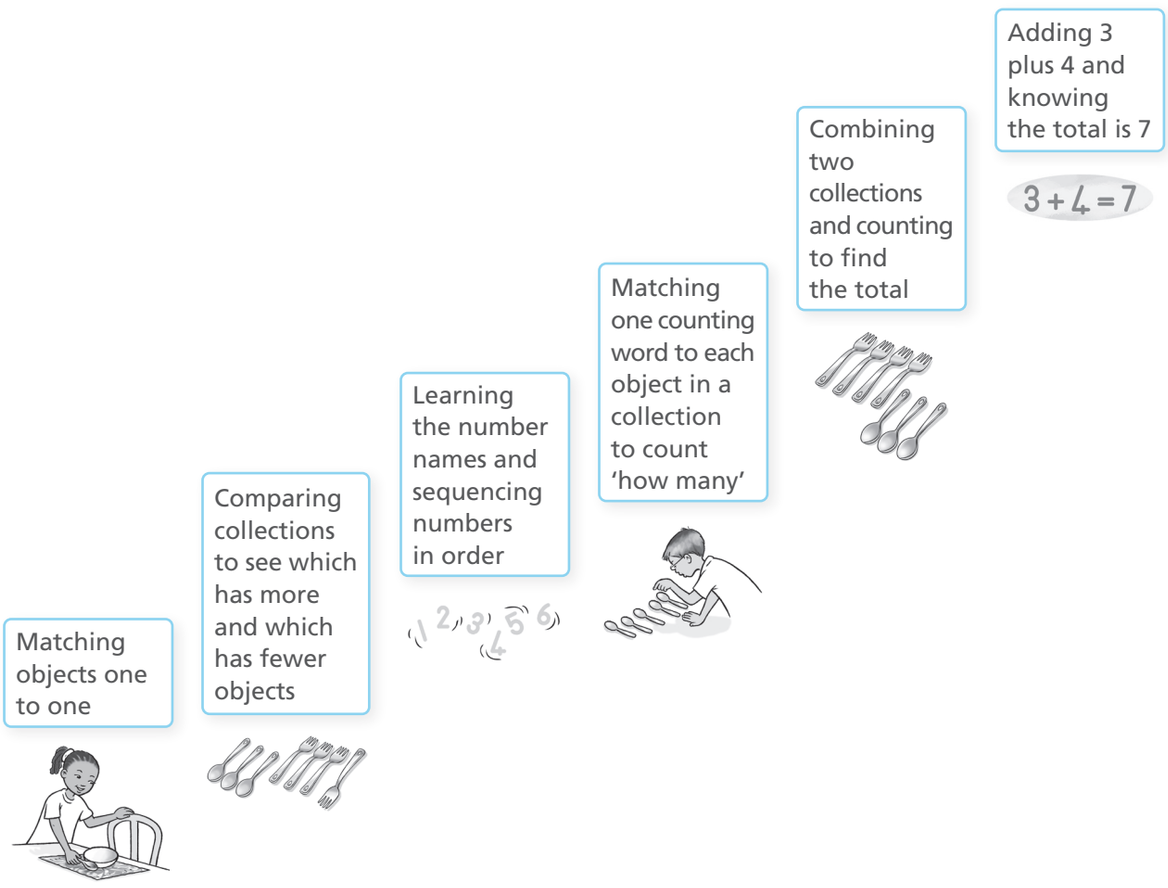


Figure 43 Progression

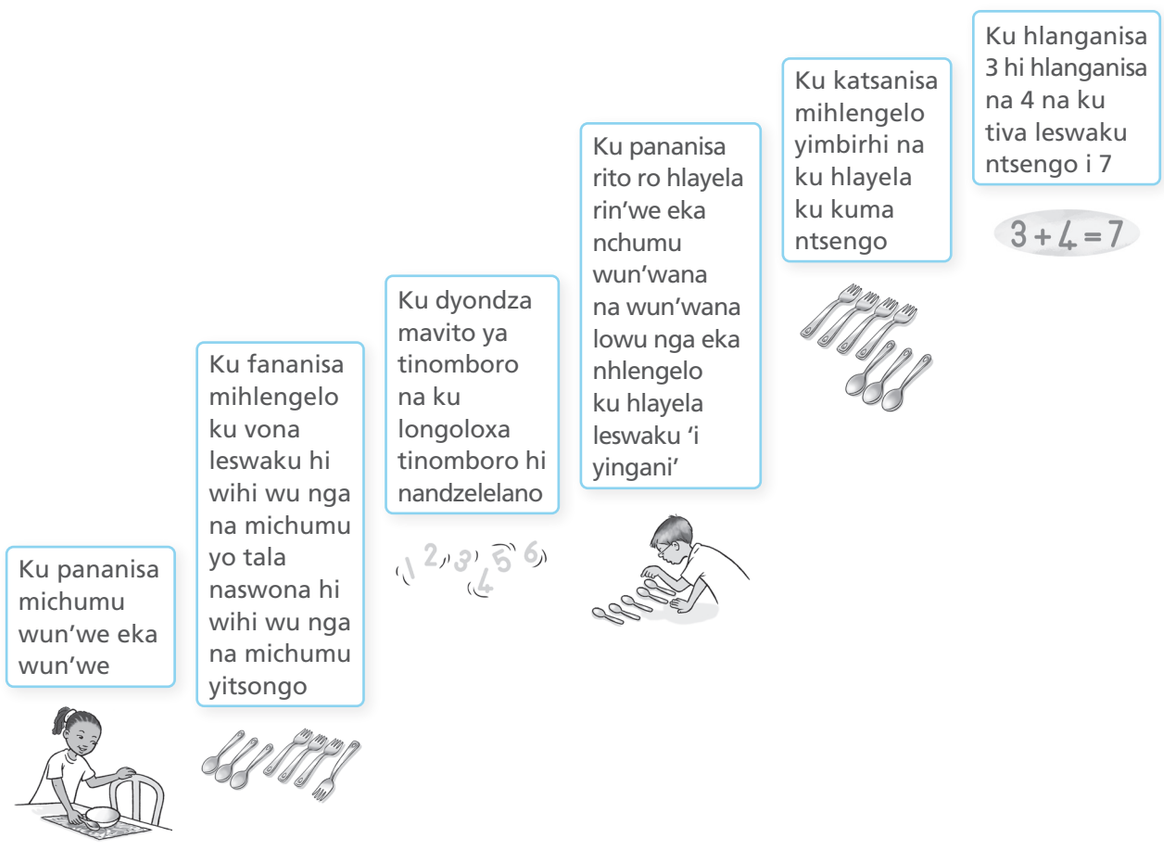
U nga ha ehleketa hi ku n'wi nyika nhlanga ya '5' leyi tsariweke ekhadini kumbe u nga ha ehleketa hi ku n'wi nyika ntlhanu wa swimhandzana, kumbe u n'wi komba ntlhanu wa tintiho. A swi koteki ku komba nomboro hi yoxe hikuva i mianakanyo leyi nga etinhlokweni ta hina, hikokwalaho hi kuma tindlela ta ku komba kumbe ku endla vuyimeri bya nomboro, swo tanihi ku tirhisa nhlengelo wa michumu, xifaniso kumbe mfungho wo tanihi nhlanga kumbe rito.

Eka maendlelo ...

Pfuna vadyondzi ku aka vutivi byintshwa bya metse na minongoti ku ya hi mitokoto ya vona ya masiku hinkwawo:

- Tswonga kusuka eka vutivi bya vadyondzi bya nkarhi lowu nga hundza loko u tivisa minongoti leyintshwa ya metse.
- Tirhisa swiyimo swo tirhiseka ku kombisa minongoti ya metse leyintshwa.
- Endla vuxaka exikarhi ka migingiriko na minongoti ya masiku hinkwawo.
- Kunguhata migingiriko leyi yi akaka ehenhla ka na ku tiyisa ntwisiso wa vadyondzi wa nongoti wa metse.

Xifaniso xa 43 xi kombisa ku ya emahlweni ko olova kusuka eka migingiriko ya masiku hinkwawo ku ya eka minongoti yo pfilungana ya ka Giredi ya V. Yi sungula hi migingiriko ya masiku hinkwawo leyi yi nga na vuxaka na tinomboro na minongoti ya nomboro yo sungula naswona yi hundzela eka minongoti yo pfilungana ya nomboro.



Xifaniso xa 43 Ku ya emahlweni

Representing number

During Grade R, learners use symbols to **represent** words, images and ideas. Children first learn to represent ideas or actions through fantasy play, for example, a learner's arms are the aeroplane wings as she zooms around the room, or a learner might use a plastic lid as a steering wheel to drive a car.

GLOSSARY

represent
to use objects, symbols or actions to stand for an idea or concept

Learners begin to represent numbers using their fingers and then gradually start to use other methods, such as objects, drawings, pictures or symbols. Learners progress:

- from using actual objects to represent numbers, e.g. lemons, sweets, pencils, leaves
- to using pictures or drawings to represent the objects, e.g. a drawing of a lemon, person, car
- to using counters to represent the objects or pictures, e.g. plastic discs to show the number of lemons
- to using marks to represent the physical objects and pictures, e.g. circles, dots, tally marks
- to using written number symbols and number words, e.g. '2' or 'two'.

Here are some different ways of representing 'five'.

Figure 44 Different representations of 'five'

Different kinds of numbers

There are different kinds of number in the number system. **In Grade R we focus only on understanding and using whole numbers (counting numbers).**

In higher grades, learners will learn that:

- **integers** include whole numbers and negative numbers
- **rational numbers** include whole numbers, negative numbers, decimals and fractions.

Ku endla vuyimeri bya nomboro

Eka Giredi ya V, vadyondzi va tirhisa mifungho ku endla **vuyimeri** bya marito, swifaniso na mianakanyo. Vana va rhanga va dyondza ku endla vuyimeri bya mianakanyo kumbe swiendlo hi ku tirhisa ntlangu wa milorho, tanihi xikombiso, mavoko ya mudyondzi i timpapa ta xihahampfhuka loko a ri karhi tsutsumatsutsuma ekamareni, kumbe mudyondzi a nga ha tirhisa xipfalo xa pulasitiki tanihi xidirayivhelo xa movha.

DLILOSARI

vuyimeri
ku tirhisa michumu, mifungho kumbe swiendlo ku yimela muanakanyo kumbe nongoti

Vadyondzi va sungula ku endla vuyimeri bya tinomboro hi ku tirhisa tintiho ta vona kutani endzhaku ka swona hi katsongotsongo va sungula ku tirhisa maendlelo man'wana, yo tanihi michumu, swidirowiwa, swifaniso kumbe mifungho. Vadyondzi va ya emahlweni:

- kusuka eka ku tirhisa michumu ya xiviri ku endla vuyimeri bya tinomboro, xik. swikwavava, swiwitsi, tipensele, matluka
- kuya eka ku tirhisa swifaniso kumbe swidirowiwa ku endla vuyimeri bya michumu, xik. xidirowiwa xa xikwavava, munhu, movha
- kuya eka ku tirhisa swo hlayela ku endla vuyimeri bya michumu kumbe swifaniso, xik. tidisiki ta pulasitiki ku komba nhlayo ya swikwavava
- kuya eka ku tirhisa mithalo ku endla vuyimeri bya michumu yo khomeka na swifaniso, xik. swirhendzevutana, mathonsi, mithalo
- kuya eka ku tirhisa mifungho ya tinomboro na mavito ya tinomboro yo tsariwa, xik. '2' kumbe 'mbirhi'.

Hi leti tindlela tin'wana to hambanahambana ta ku endla vuyimeri bya 'ntlhanu'.

Xifaniso xa 44 Vuyimeri byo hambanahambana bya 'ntlhanu'

Mixaka yo hambanahambana ya tinomboro

Ku na mixaka yo hambanahambana ya nomboro eka sisiteme ya tinomboro. **Eka Giredi ya V hi kongomisa ntsena eka ku twisisa na ku tirhisa tinomboroxiheri (tinomboro to hlayela).**

Eka tigiredi ta le henhla, vadyondzi va ta dyondza leswaku:

- **tiinthijara** ti katsa tinomboroxiheri na tinomboro ta mfungho wo susa
- **tinomboro ta mitsengo** ti katsa tinomboroxiheri, tinomboro ta mfungho wo susa, tidesimali na tifurakixini.

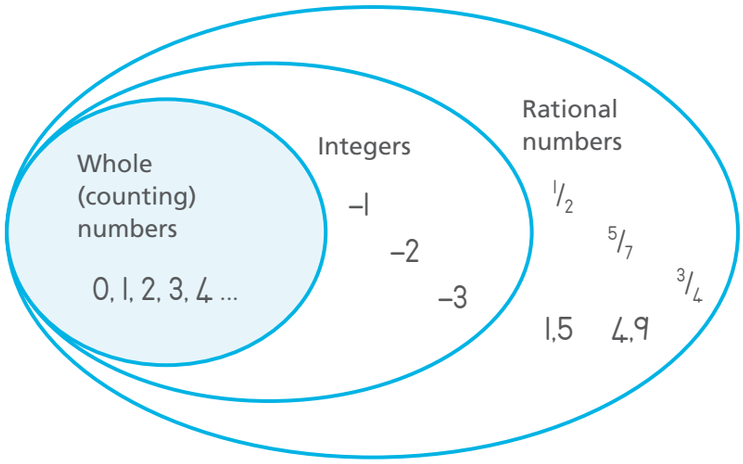


Figure 4.5 In Grade R the focus is on whole numbers.

Subitising

Subitising involves immediately recognising, without counting, the number of items in small collections. Subitising is an early skill that exists before learning number names and symbols or learning to count. Subitising forms a strong foundation for counting collections of objects and for early calculation.

GLOSSARY

subitising
the cognitive ability to immediately recognise the total number of objects in a collection without counting

Perceptual subitising

Perceptual subitising is the ability to immediately perceive the number of objects in a small collection. Young children are able to perceive or recognise the difference between a number of objects in a collection, without counting, and can say which is more or which is fewer without knowing number names or symbols. Often, they can use their fingers to match and show the same number of objects. Gradually they learn to match number names to the collection and will be able to say, without counting, that there are one, three, two, five objects in a collection. This form of subitising is only possible with a small number of objects and most children and adults can accurately do this up to five.

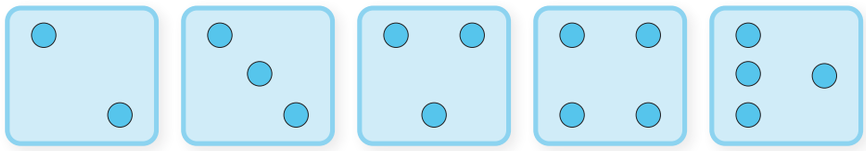
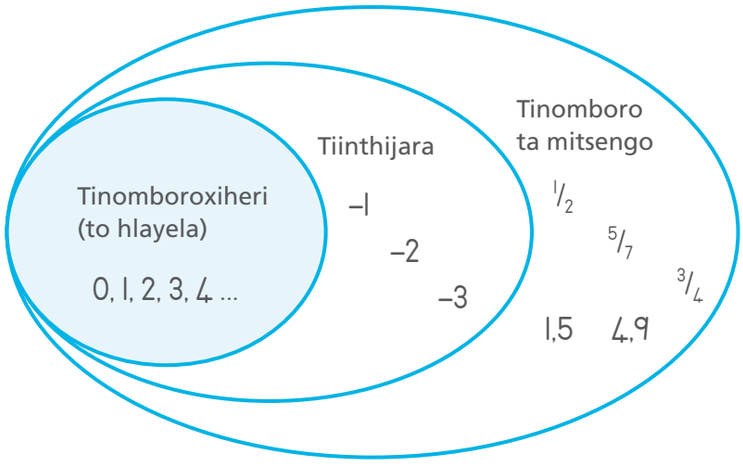


Figure 4.6 Dot arrangements for two, three and four

Conceptual subitising

In Grade R the learners' ability to recognise 'how many' objects there are in a collection increases. It can extend to amounts larger than five by making use of number images, such as the arrangement of the dots on dice, dominoes and ten-frames.



Xifaniso xa 4.5 Eka Giredi ya V nkongomo wu le ka tinomboroxiheri.

Ku vhumba ntsengo

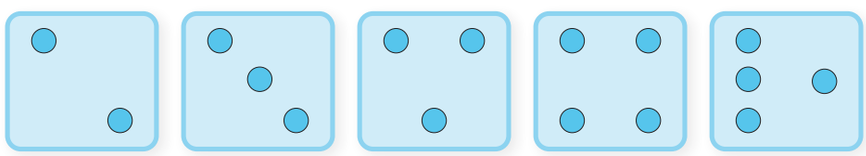
Ku **vhumba ntsengo** swi khumba ku lemuka xikan'wekan'we, handle ko hlayela, nhlayo ya michumu leyi nga eka mihlengelo leyitsongo. Ku vhumba ntsengo i xikili xa le masungulweni lexi nga kona ku nga si va na ku dyondza ka mavito ya tinomboro na mifungho ya tinomboro kumbe ku dyondza ku hlayela. Ku vhumba ntsengo swi vumba masungulo yo tiya ya ku hlayela mihlengelo ya michumu na le ka nkhakhuleto wa le masungulweni.

DLILOSARI

vhumba ntsengo
vuswikoti bya ku twisisa ku lemuka xikan'wekan'we ntsengo hinkwawo wa michumu leyi nga eka nhlengelo handle ko hlayela

Ku vhumba ntsengo hi ku vona

Ku vhumba ntsengo hi ku vona i vuswikoti bya ku vona xikan'wekan'we nhlayo ya michumu leyi nga eka nhlengelo lowutsongo. Vana lavatsongo va kota ku vona kumbe ku lemuka ku hambana exikarhi ka nhlayo ya michumu leyi nga eka nhlengelo, handle ko hlayela, naswona va nga kota ku vula leswaku hi wihi wu nga tala kumbe hi wihi wu nga wutsongo handle ko tiva mavito ya tinomboro kumbe mifungho ya tinomboro. Hakanyingi, va nga tirhisa tintiho ta vona ku pananisa na ku komba nhlayo yo fana ya michumu. Hi katsongotsongo va dyondza pananisa mavito ya tinomboro eka nhlengelo naswona va ta kota ku vula, handle ko hlayela, leswaku ku na nchumu wun'we, yinharhu, yimbirhi, ya ntlhanu eka nhlengelo. Muxaka lowu wa ku vhumba ntsengo wu koteka ntsena hi nhlayo leyitsongo ya michumu naswona vana vo tala na vatswatsi va nga kota ku endla leswi hi nkhaqato kufika eka ntlhanu.



Xifaniso xa 4.6 Maveketelelo ya mathonsi ya mbirhi, nharhu na mune

Ku vhumba ntsengo ka xinongoti

Eka Giredi ya V vuswikoti bya vadyondzi ku lemuka leswaku ku na michumu 'yingani' eka nhlengelo bya engetela. Byi nga ndlandlamuka kufika eka mitsengo yikulu kutlula ntlhanu hi ku tirhisa swifaniso swa tinomboro swo tanihi maveketelelo ya mathonsi lama nga eka madayizi, tidomino na marimba ya khume.

In the examples below, by using conceptual subitising, learners can immediately recognise that these cards each show seven objects.

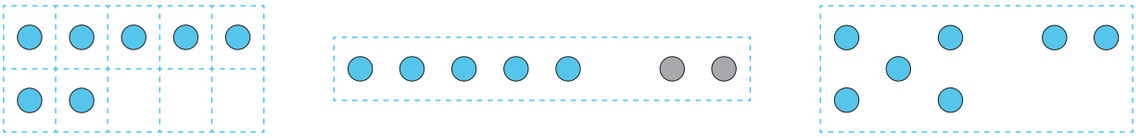


Figure 47 Dot arrangements for seven

This extended form of subitising is called conceptual subitising. It is based on part–whole knowledge and enables learners to quickly identify numbers larger than five.

In practice ...

Learners enjoy playing games that involve quickly showing a small number of objects before hiding them, then asking how many there were. Matching and counting games will consolidate subitising, for example, recognising a number of objects without counting. This will help the learners with memorising number combinations to ten and early calculations (addition and subtraction).

Dot cards can be used to:

- present different number arrangements from one to five
- support the development of recognition of small numbers
- associate number names with small collections
- match counters to the dots.

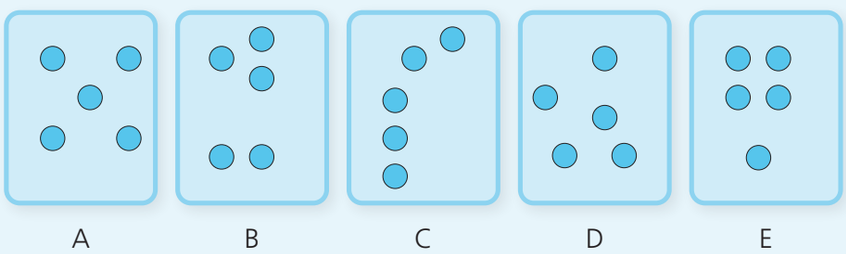


Figure 48 Dot cards

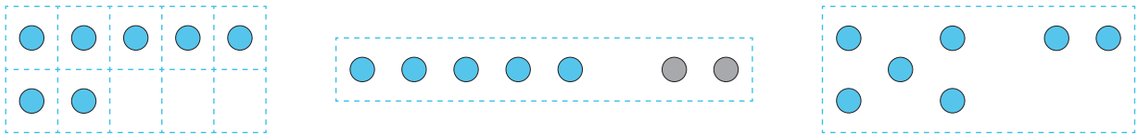
Activities such as dominoes and dice games provide fun opportunities to practise subitising skills.

Counting

Counting is a complex skill that needs lots of practice. Learners develop it as they practise counting real objects. Often they begin by imitating the counting of older learners and adults.

There are two activities that involve counting. The first is oral or rote counting that involves memorising the names and order of the counting numbers, often in a rhyme or song. The second is counting objects one by one to find out 'how many'.

Eka swikombiso leswi nga laha hansi, hi ku tirhisa ku vhumba ntsengo ka xinongoti vadyondzi va nga kota ku lemuka xikan'wekan'we leswaku rin'wana na rin'wana ra makhadi lama ri komba nkombo wa michumu.



Xifaniso xa 47 Maveketelelo ya mathonsi ya nkombo

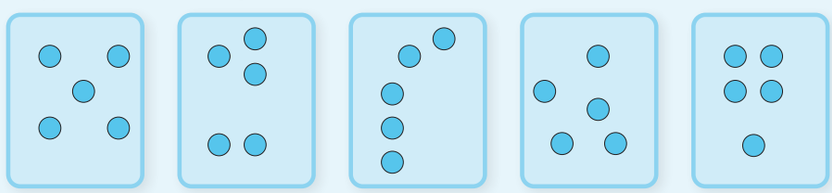
Muxaka lowu ndlandlamukisiweke wa ku vhumba ntsengo wu vitaniwa ku vhumba ntsengo ka xinongoti. Wu simekiwile eka vutivi bya xiphemu–hinkwaxo naswona wu kotisa vadyondzi ku kuma hi ku hatlisa tinhlayo leti nga tikulu kutlula ntlhanu.

Eka maendlelo ...

Vadyondzi va tiphina hi ku tlanga mitlangu leyi yi khumbaka ku komba hi ku hatlisa nhlayo leyitsongo ya michumu yi nga si tumbetiwa, endzhaku ka swona va vutisiwa leswaku a ku ri na swingani. Mitlangu ya ku pananisa na ku hlayela yi ta tiyisa ku vhumba ntsengo, tanihi xikombiso, ku lemuka nhlayo ya michumu handle ko hlayela. Leswi swi ta pfuna vadyondzi ku bela enhlokweni mikatsano ya tinomboro kufika eka khume na mikhakhuleto ya le masungulweni (ku hlanganisa na ku susa).

Makhadi ya mathonsi ya nga tirhisiwa ku:

- nyika maveketelelo ya tinomboro to hambanahambana kusuka eka n'we kufika eka ntlhanu
- seketela nhluvukiso wa ndzemuko wa tinomboro letitsongo
- fambelanisa mavito ya tinomboro hi mihlengelo leyitsongo
- pananisa swo hlayela na mathonsi.



Xifaniso xa 48 Makhadi ya mathonsi

Migingiriko yo tanihi mitlangu ya tidomino na madayizi yi nyika mikarhi yo tiphina ku titoloveta swikili swa ku vhumba ntsengo.

Ku hlayela

Ku hlayela i xikili xo pfilungana lexi xi lavaka vutitoloveti byo tala. Vadyondzi va xi kurisa loko va ri karhi va titoloveta ku hlayela michumu ya xiviri. Hakanyingi va sungula hi ku encenyeta ku hlayela ka vadyondzi lavakulunyana na vatswatsi.

Ku na migingiriko yimbirhi leyi yi khumbaka ku hlayela. Xavun'we i ku hlayela ka swanomu kumbe ku hlayela hi ku bela enhlokweni leswi swi khumbaka ku bela enhlokweni mavito na nxaxamelo wa tinomboroxiheri, hakanyingi leti nga eka rhayimi kumbe risimu. Xavumbirhi i ku hlayela michumu hi wun'wewun'we ku kumisisa leswaku 'i yingani'.

Oral counting

In Grade R, learners learn the correct order of number names and repeat the sequence daily, counting out loud. This kind of **oral counting** is also called **rote** or **acoustic counting**. The purpose of counting out loud is to help learners understand that when we count, there is a set order for the number names, beginning at one, and then following with two, three, four. Initially, learners do not fully understand the meaning of the number names and might skip numbers in a counting sequence.

Reciting a rhyme or series of numbers orally means repeating the numbers from memory. Even when learners count in steps of two, five and ten they are using their knowledge of this number order. Learning number names and repeating them in the correct order does not necessarily mean that learners can count. This is different from counting to find out 'how many'.

GLOSSARY

oral counting/ rote counting/ acoustic counting
counting out loud, saying the numbers in the correct order

rational counting/ resultative counting
counting objects to find out 'how many'

Counting objects

Counting objects is also called **rational** or **resultative counting**. This means that objects or events are matched with a number name. To count 'how many', learners need to realise that each object in a collection gets a number name ('one, two, three, four …') and that you count each object only once.

With plenty of hands-on activities and guidance from the teacher, learners begin to understand and apply the following counting principles:

1. **One-to-one correspondence principle:** Matching one, and only one, counting word to each object in the collection being counted. Initially learners might count the same object twice, skip an object or forget which objects have been counted. It is useful for learners to touch and move objects as they count.
2. **Stable order principle:** Number names are always arranged in the same fixed order, e.g. one is followed by two, two is followed by three, three is followed by four, and so on.
3. **Cardinal principle:** The last number name said when counting a collection, represents the total number in the collection.
4. **Abstraction principle:** Learners understand that even if groups with the same number of objects look very different (e.g. five grapes, five people, five houses) they have the same numerosity, i.e. 'fiveness'. They realise that counting can be applied to objects, pictures, colours, shapes, or even actions or sounds.
5. **Order-irrelevance principle:** The order of counting the objects in a collection does not matter. Learners need to understand that however we arrange the objects, the total number of objects in the collection remains the same.

Ku hlayela ka swanomu

Eka Giredi ya V, vadyondzi va dyondza nandzelelano lowu nga lulama wa mavito ya tinomboro na ku vuyelela malongolokelo lama siku na siku, hi ku hlayela ehenhla. Muxaka lowu wa **ku hlayela ka swanomu** ku tlhela ku vitaniwa **ku hlayela hi ku bela enhlokweni** kumbe **ku hlayela ka mpfumawulo**. Xikongomelo xa ku hlayela ehenhla i ku pfuna vadyondzi ku twisisa leswaku loko hi hlayela ku na nandzelelano lowu vekiweke wa mavito ya tinomboro, ku sungula eka n'we, kutani endzhaku ku landzela mbirhi, nharhu, mune. Emasungulweni, vadyondzi a va twisisi hi vutalo nhlamuselo ya mavito ya tinomboro naswona va nga ha tlula tinomboro eka malongolokelo ya ku hlayela.

Ku tlhokovetsela rhayimi kumbe ntlhandlamano wa tinomboro hi nomu swi vula ku vuyelela tinomboro kusuka eka nkhumbulo. Hambiloko vadyondzi va hlayela hi magoza mambirhi, ntlhanu na khume va le ku tirhiseni ka vutivi bya vona bya nandzelelano lowu wa tinomboro. Ku dyondza mavito ya tinomboro na ku ma vuyelela hi nandzelelano lowu nga lulama a swi vuli ngopfungopfu leswaku vadyondzi va swi kota ku hlayela. Leswi swi hambanile na ku hlayela ku kumisisa leswaku i 'swingani'.

DLILOSARI

ku hlayela ka swanomu/ku hlayela hi ku bela enhlokweni/ ku hlayela ka mpfumawulo
ku hlayela ehenhla, ku vula tinomboro hi nandzelelano lowu nga lulama

ku hlayela ka mitsengo/ ku hlayela ka xin'wexin'we
ku hlayela michumu ku kuma leswaku i 'swingani'

Ku hlayela michumu

Ku hlayela michumu swi tlhela swi vitaniwa **ku hlayela ka mitsengo** kumbe **ku hlayela ka xin'wexin'we**. Leswi swi vula leswaku michumu kumbe swiendleko swi pananisiwa na vito ra nomboro. Ku hlayela leswaku 'i swingani', vadyondzi va fanele ku vona leswaku nchumu wun'wana na wun'wana lowu nga eka nhlengelo wu kuma vito ra nomboro ('n'we, mbirhi, nharhu, mune …') na leswaku u hlayela nchumu wun'wana na wun'wana kan'we ntsena.

Hi vunyingi bya migingiriko yo endla na ndzetelo wa mudyondzisi, vadyondzi va sungula ku twisisa na ku tirhisa milawu yo hlayela leyi landzelaka:

1. **Nawu wa yelano wa xin'we-eka-xin'we:** Ku pananisa n'we, na n'we ntsena, rito ro hlayela eka nchumu wun'wana na wun'wana lowu nga eka nhlengelo lowu hlayeriwaka. Emasungulweni vadyondzi va nga hlayela nchumu wun'we kambirhi, va tlula nchumu wo karhi kumbe va rivala leswaku i michumu yihi leyi va yi hlayeleke. Swa pfuna eka vadyondzi ku khumba na ku fambisa michumu loko va ri karhi va hlayela.
2. **Nawu wa nandzelelano lowu nga cincacinciki:** Mavito ya tinomboro mikarhi hinkwayo ya veketeriwa hi nandzelelano lowu nga cincacinciki wo fana, xik. n'we yi landzeriwa hi mbirhi, mbirhi yi landzeriwa hi nharhu, nharhu yi landzeriwa hi mune, na swo kota sweswo.
3. **Nawu wa masungulo:** Vito ra nomboro yo hetelela ku vuriwa loko ku hlayeriwa nhlengelo ri yimela nhlayo hinkwayo leyi nga eka nhlengelo.
4. **Nawu wo anakanya:** Vadyondzi va twisisa leswaku hambiloko mitlawa yi ri na nhlayo yo fana ya michumu yi languteka yi hambanile (xik. ntlhanu wa madiriva, ntlhanu wa vanhu, ntlhanu wa tindlu) yi na nhlayo ya nhlengelo wun'we, h.l. 'vuntlhanu'. Va vona leswaku ku hlayela ku nga tirhisiwa eka michumu, swifaniso, mihlovo, swivumbeko, kumbe hambi swi ri swiendlo kumbe mipfumawulo.
5. **Nawu wa nandzelelano-hambuko:** Nandzelelano wa ku hlayela michumu leyi nga eka nhlengelo a wu na mhaka. Vadyondzi va fanele ku twisisa leswaku hambiloko hi nga xaxameta michumu njhani, ntsengo hinkwawo wa michumu lowu nga eka nhlengelo wu tshama wa ha fana.

Figure 49 Example of the abstraction principle

Once learners have understood and can apply all five of these counting principles, we can confidently say that they can count.

In practice ...

With practice, learners understand that counting can be used to compare collections of objects. Once learners know the counting sequence or order of the counting numbers they:

- begin to understand that each number in the counting sequence is one bigger than the number before and one smaller than the next number.
- can mentally compare numbers and see that two is one more than one, and that three is one more than two.
- realise that numbers grow by one each time and that any number in the counting sequence is exactly one more than the previous number.

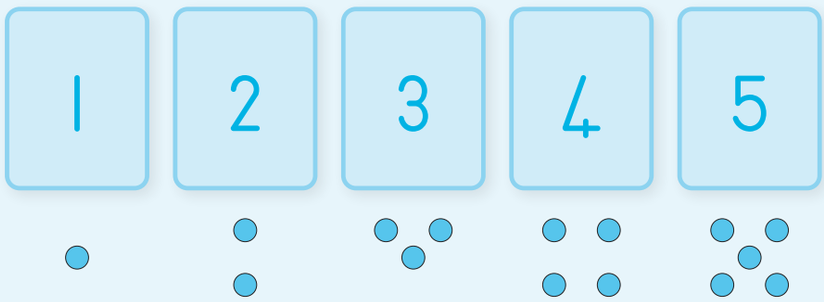


Figure 50 Counters represent number quantities in order.

Estimation

Although counting is about finding the exact number of objects in a collection, learners also need to develop estimation skills so that they can say 'about' how many objects there are in a collection. They need to be able to use terms such as 'a lot', 'few', 'more', 'too many' or 'the same as'. Estimating is about learners using their understanding of number to make sensible and accurate guesses about quantities and amounts while realising that an estimate does not need to be exactly right. Learners are often reluctant to make a guess in case it is incorrect.

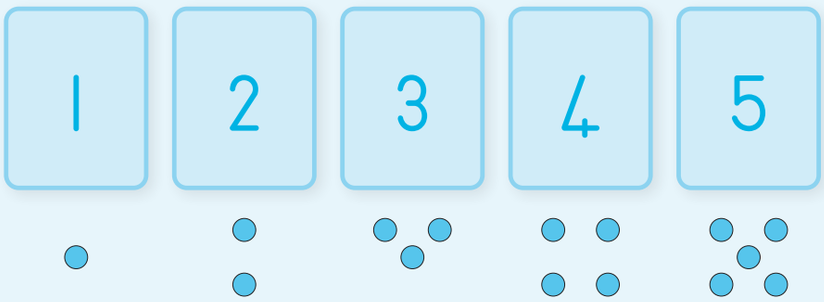
Xifaniso xa 49 Xikombiso xa nawu wo anakanya

Xikan'wekan'we loko vadyondzi va twisisile na ku kota ku tirhisa hinkwayo milawu leya ntlhanu yo hlayela, hi nga vula hi vutitshembi leswaku va kota ku hlayela.

Eka maendlelo ...

Hi ku endla, vadyondzi va twisisa leswaku ku hlayela swi nga tirhisiwa ku fananisa mihlengelo ya michumu. Xikan'wekan'we loko vadyondzi va tiva malongolokelo yo hlayela kumbe nandzelelano wo hlayela wa tinomboroxiheri va:

- sungula ku twisisa leswaku nomboro yin'wana na yin'wana leyi nga eka malongolokelo yo hlayela i yikulukumba hi n'we kutlula nomboro leyi nga emahlweni ka yona naswona i yitsongo hi n'we kutlula nomboro leyi landzelaka.
- nga kota ku fananisa emihleketweni tinomboro na ku vona leswaku mbirhi yi tele hi n'we kutlula n'we, na leswaku nharhi yi tele hi n'we kutlula mbirhi.
- vona leswaku tinomboro ti kula hi n'we nkarhi na nkarhi na leswaku nomboro yihi kumbe yihi eka malongolokelo yo hlayela yi tele hi n'we kwatsa kutlula nomboro leyi nga hundza.



Xifaniso xa 50 Swo hlayela swi yimela mitalo ya tinomboro eka nandzelelano.

Nkumbetelo

Hambileswi ku hlayela swi nga hi mayelana na ku kuma nhlayo ya nkhaqato ya michumu leyi nga eka nhlengelo, vadyondzi va fanele ku tlhela va hluvukisa swikili swa nkumbetelo ku endlela leswaku va kota ku vula leswaku 'kwalomu' leswaku i michumu yingani yi nga eka nhlengelo. Va fanele ku kota ku tirhisa matheme yo tanihi 'tala', 'ntsongo', 'tele', 'tala kutlula mpimo' kumbe 'ku fana na'. Ku kumbetela swi hi mayelana na leswaku vadyondzi va tirhisa ntwisiso wa vona ku endla mivhumbo yo twala na ku va ya nkhaqato hi mayelana na mitalo na mipimo loko va ri karhi va vona leswaku nkumbetelo a wu dingi ku va swi lulamile hi nkhaqato. Hakanyingi vadyondzi va kanakana ku vhumba hi ku chava leswaku swi ta va swi hoxekile.

In practice ...

Although learners may not yet be able to count a number of objects precisely, they can find an answer by estimation.

- Based on the visual image, learners can see that there are more objects or items in a picture. They can say which has more or which has fewer.
- Learners can find the answer by using one-to-one matching of the objects from two collections to compare which collection has the most and which has the least.
- Learners can compare the number of items in two pictures by drawing a line around the same number of items in each picture.
- Learners can also use their hands to cover a number of items, for example, four ice creams in each picture. It would be clear that there are more ice creams uncovered in the first picture.

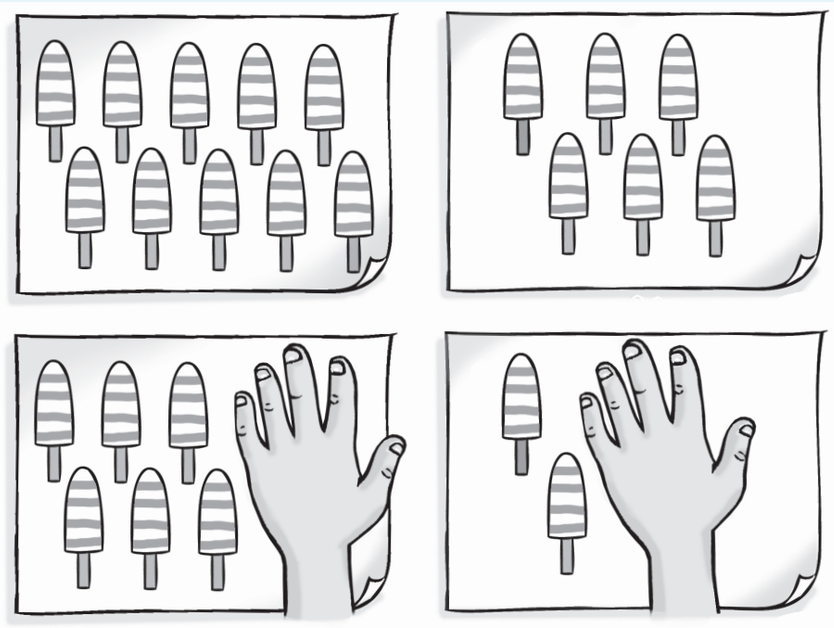


Figure 51 Estimating based on the visual image that is seen

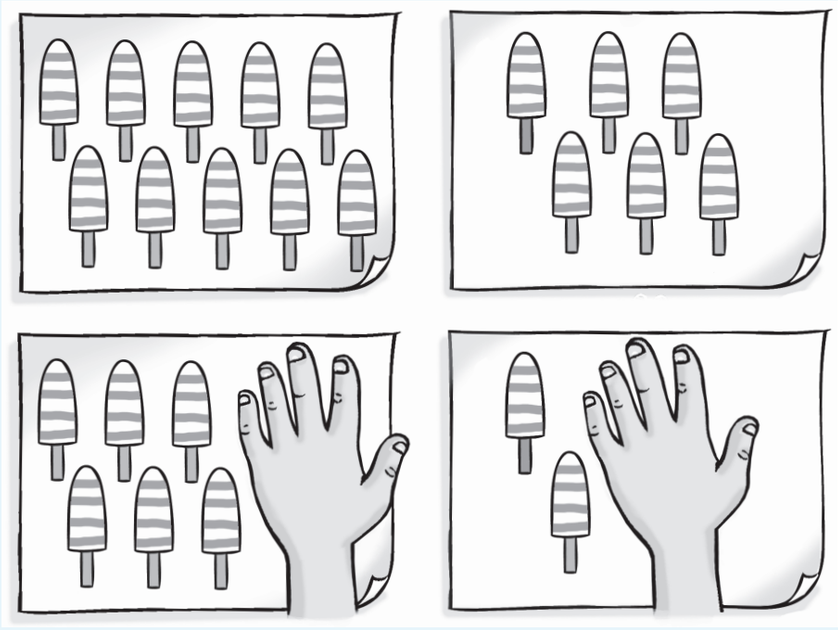
Ordinal numbers

Ordinal numbers are used to describe the place or position of a person or object, for example, in a line or row. Learners understand that if they run a race they don't come 'three' they come 'third'. In the same way, they know that they don't stand 'one' in line but rather 'first'.

Eka maendlelo ...

Hambiloko vadyondzi va nga si kota ku hlayela nhlayo ya michumu hi nkhaqato, va nga kota ku hlamula hi nkumbetelo.

- Hi ku ya hi xifaniso xo voniwa vadyondzi va nga kota ku vona leswaku ku na michumu yo tala leyi nga exifanisweni. Va nga kota ku vula leswaku hi xihi xi nga na swo tala kumbe hi xihi xi nga na switsongo.
- Vadyondzi va nga swi kota ku kuma nhlamulo hi ku tirhisa mpananiso wa xin'we-eka-xin'we wa michumu kusuka eka mihlengelo yimbirhi ku fananisa leswaku i nhlengelo wihi wu nga na swo tala kutlula hinkwaswo naswona hi wihi wu nga na switsongo kutlula hinkwaswo.
- Vadyondzi va nga fananisa nhlayo ya michumu leyi nga eswifanisweni swimbirhi hi ku dirowa layini yi rhendzela nhlayo yo fana ya michumu leyi nga eka xifaniso xin'wana na xinwana.
- Vadyondzi va nga tlhela va tirhisa swandla swa vona ku funengeta nhlayo ya michumu, tanihi xikombiso, mune wa tiayisikhirimi leti nga exifanisweni xin'wana na xin'wana. Swi ta va erivaleni leswaku ku na tiayisikhirimi to tala leti nga funengetiwangiki exifanisweni lexo sungula.



Xifaniso xa 51 Ku kumbetela hi ku ya hi xifaniso xo voniwa lexi xi voniwaka

Tinomboro ta odinali

Tinomboro ta odinali ti tirhisiwa ku hlamusela ndhawu kumbe xiyimo xa munhu kumbe nchumu, xik. elayinini kumbe erixaxeni. Vadyondzi va twisisa leswaku loko va tsutsuma mphikizano wo siyana a va khomi xiyimo xa 'nharhu' va khoma xiyimo xa 'vunharhu'. Hi ndlela yo fana, va swi tiva leswaku loko va yima elayinini a va le ka 'n'we' kambe va le ka 'vun'we'.

Figure 52 First, second and third positions

Calculating

A good understanding of number and counting is important for learning how to calculate. Learners first need to understand the relationship between numbers: comparison, ordering and partitioning numbers (breaking down and building up) in order to learn number operations, such as addition, subtraction, multiplication and division.

Activities and experiences that involve breaking down and building up numbers, adding to and comparing collections are the beginning of the concept of combining (addition) and separating (subtraction). Grade R learners are also exposed to addition and subtraction during their everyday games and activities, e.g. when they play 'shop' together or have to share toys. For subtraction, learners need to take part in practical activities that involve 'taking away', in other words, finding how many are left in a collection of objects when some have been removed. Initially learners will use counting strategies to solve problems involving addition or subtraction, e.g. counting all the objects in two collections to reach a total amount when the two collections are combined, or counting how many coins are left when some have been given away.

Multiplication, division and fractions are not formally taught in Grade R, but learners use these concepts when they solve problems that involve making groups of objects and when they share something equally. Activities that involve repeated addition and repeated subtraction lay the foundation for the concepts of multiplication and division. These activities also help to establish relationships between addition and multiplication, and subtraction and division, which need to be understood later on at school.

In practice ...

Present learners with problems that explore making equal groups and equal sharing, for example:

- Ask three learners to each take two counters. Together count the total number of counters, e.g. two and two is four and two is six (repeated addition).

Xifaniso xa 52 Swiyimo swa vun'we, vumbirhi na vunharhu

Ku khakhuleta

Ntwisiso wa kahle wa nomboro na ku hlayela i swa nkoka eka ku dyondza hilaha ku khakhuletiwaka hakona. Vadyondzi va fanele ku rhanga va twisisa vuxaka exikarhi ka tinomboro: ku fananisa, ku xaxameta na ku ava tinomboro (ku tlhantlha na ku aka) hi xikongomelo xa ku dyondza tioparexini ta tinomboro, to tanihi ku hlanganisa, ku susa, ku andzisa na ku avanyisa.

Migingiriko na mitokoto leyi yi khumbaka ku tlhantlha na ku aka tinomboro, ku hlanganisa eka na ku fananisa mihlengelo i masungulo ya nongoti wa ku katsanisa (ku hlanganisa) na ku hambanisa (ku susa). Vadyondzi va Giredi ya V va tlhela va tivisiwa ku hlanganisa na ku susa hi nkarhi wa mitlangu na migingiriko ya vona ya masiku hinkwawo, xik. loko va tlanga 'vhengele' swin'we kumbe va fanele ku avelana switlangiso. Eka ku susa, vadyondzi va fanele ku teka xiave eka migingiriko yo endla leyi yi khumbaka 'ku humesa', hi marito man'wana, va kuma leswaku i swingani swi nga sala eka nhlengelo wa michumu loko swin'wana swi humesiwile. Ekusunguleni vadyondzi va ta tirhisa maqhinga yo hlayela ku ololoxa swiphiqo leswi swi khumbaka ku hlanganisa kumbe ku susa, xik. ku hlayela michumu hinkwayo eka mihlengelo yimbirhi ku fikelela nhlayo hinkwayo loko mihlengelo leyimbirhi yi katsanisiwa, kumbe va hlayela leswaku i swingwece swingani swi nga sala loko swin'wana swi susiwile.

Ku andzisa, ku avanyisa na tifurakixini a swi dyondzisiwi hi ndlela ya mafundza eka Giredi ya V, kambe vadyondzi va tirhisa minongoti leyi loko va ololoxa swiphiqo leswi swi khumbaka ku endla mitlawa ya michumu na loko va avelana swin'wana hi ku ringana. Migingiriko leyi yi khumbaka ku hlanganisa loku vuyeleriweke na ku susa loku vuyeleriweke yi vumba masungulo ya minongoti ya ku andzisa na ku avanyisa. Migingiriko leyi yi tlhela yi pfuna ku tumbuluxa vuxaka exikarhi ka ku hlanganisa na ku andzisa, na ku susa na ku avanyisa, leswi swi lavaka ku twisisiwa endzhaku ka nkarhi exikolweni.

Eka maendlelo ...

Nyika vadyondzi swiphiqo leswi swi valangaka ku endla mitlawa yo ringana na ku avelana ko ringana, tanihi xikombiso:

- Kombela vadyondzi vanharhu leswaku un'wana na un'wana a teka swo hlayela swimbirhi. Mi ri swin'we hlayelani nhlayo hinkwayo ya swo hlayela, xik. mbirhi na mbirhi i mune, naswona mune na mbirhi i tsevu (ku hlanganisa loku vuyeleriweke).

- Place six counters on the mat. Remove two at a time as you say, 'six take away two is four, take away two is two and take away two leaves nothing' (repeated subtraction).
- Give learners cut-out circles. Ask them to make equal groups on each circle using counters, e.g. two in each circle.
- Ask learners to share objects equally between them, e.g. share 15 counters between three learners.
- Ask learners to share objects where the remainder must be shared, e.g. share two apples equally between three learners.

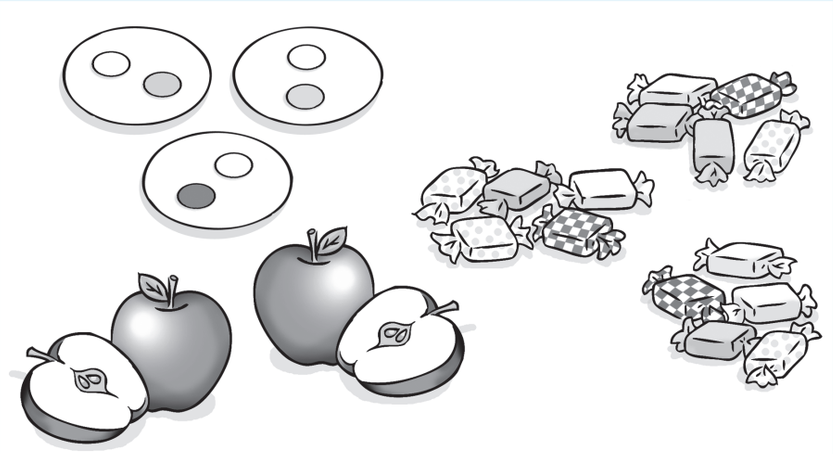
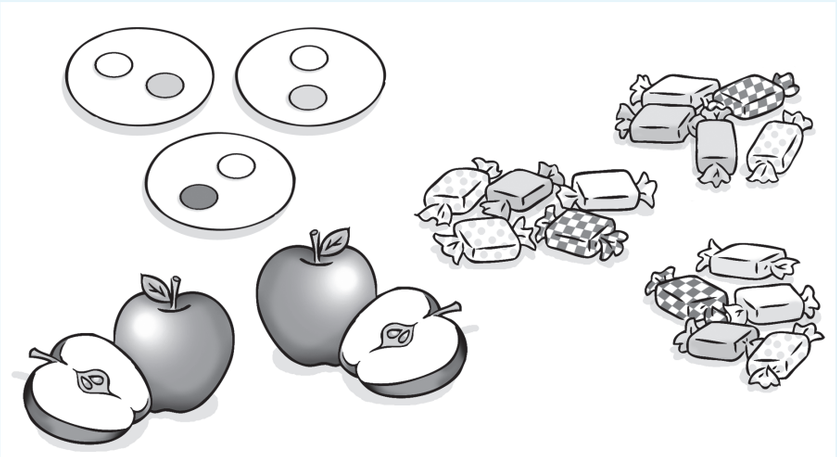


Figure 53 Using objects for calculations

Questions to ask for Numbers, Operations and Relationships

- Can you arrange these in a different way?
- How many are there?
- How many can you count?
- Who has more/fewer?
- What number comes before …? What number comes after …? What number is between … and …?
- How many more are in this group?
- If we share these equally between us, how many will we each have?
- If I cover some of these, how many are hidden?
- What number is this? (showing a number card or written numeral)
- Can you put the number cards in order?
- Who is standing first, second, …?
- If you have two of these and I give you two more, how many will you have?
- If I have three of these and I give you one, how many will I have?

- Vekela tsevu wa swo hlayela ehenhla ka mete. Susa swimbirhi hi nkarhi loko u ri karhi u vula, ‘tsevu hi susa mbirhi i mune, hi susa mbirhi i mbirhi nakambe hi susa mbirhi a ku sali nchumu’ (ku susa loku vuyeleriweke).
- Nyika vadyondzi swirhendzevutana leswi tsemeleriweke. Va kombele ku endla mitlawa yo ringana eka xirhendzevutana xin‘wana na xinwana hi ku tirhisa swo hlayela, xik. swimbirhi eka xirhendzevutana xin‘wana na xinwana.
- Kombela vadyondzi ku avelana michumu hi ku ringana exikarhi ka vona, xik. avela 15 wa swo hlayela exikarhi ka vadyondzi vanharhu.
- Kombela vadyondzi ku avelana michumu laha nsalo wu faneleke ku aviwa, xik. avela maapula mambirhi hi ku ringana exikarhi ka vadyondzi vanharhu.



Xifaniso xa 53 Ku tirhisa michumu eka mikhakhuleto

Swivutiso leswi faneleke ku vutisiwa eka Tinomboro, Tioparexini na Vuxaka

- Xana leswi u nga swi xaxameta hi ndlela yo hambana?
- Xana ku na swingani?
- Xana i swingani u nga swi hlayelaka?
- I mani a nga na swo tala/switsongo?
- Xana i mani nomboro leyi yi taka emahlweni ka …? Xana i mani nomboro leyi yi taka endzhaku ka …? Xana i mani nomboro leyi yi nga exikarhi ka … na …?
- Xana i swingani swo tala swi nga eka ntlawa lowu?
- Loko hi avelana leswi hi ku ringana exikarhi ka hina, xana i swingani leswi un‘wana na un‘wana wa hina a nga ta swi kuma?
- Loko ndzi funengeta swin‘wana swa leswi, xana i swingani swi nga tumbetiwa?
- Xana i mani nomboro leyi? (u ri karhi u komba khadi ra nomboro kumbe nhlanga leyi tsariweke)
- Xana u nga veka makhadi ya tinomboro hi ku landzelelana?
- Xana i mani a nga yima eka vun‘we, eka vumbirhi, …?
- Loko u ri na swimbirhi swa leswi kutani ndzi ku nyika swin‘wana swimbirhi, xana i swingani u nga ta va na swona?
- Loko ndzi ri na swinharhu swa leswi kutani ndzi ku nyika xin‘we, xana i swingani ndzi nga ta va na swona?

Vocabulary for Numbers, Operations and Relationships

Count and recognise numbers

- match, sort, compare
- number
- one, two, three … twenty and beyond
- none, nothing, empty, nought, zero
- how many …?
- count (up) to
- count on (from, to)
- count back (from, to)
- count in ones, twos … tens …
- more, many, few, fewer
- fewer than, greater than, most, least
- too many, too few, enough, not enough
- every other
- group, collection
- nearly, close to, about the same as
- how many left over, remaining
- just over, just under

Compare and order numbers

- match, sort, compare, order
- the same number as, as many as
- one more, two more, …
- one less, two less, …
- in front of, behind, next, next to, between
- first, second, third … tenth
- last, before, after

Of **two** objects/amounts: greater, more, larger, bigger, less, fewer, smaller

Of **three** or more objects/amounts: greatest, most, biggest, largest, least, fewest, smallest

Operations with numbers

Addition and subtraction

- match, compare
- add, more, and
- together, altogether
- double/half
- one more, two more, …
- how many more to make …?
- how many more is … than …?
- take away, subtract
- one less, two less, …
- how many are left/left over?
- difference between

Ntivomarito wa Tinomboro, Tioparexini na Vuxaka

Hlayela na ku lemuka tinomboro

- pananisa, ava, fananisa
- nomboro
- n'we, mbirhi, nharhu … makumembirhi na ku hundza
- ku hava nchumu, a ku na nchumu, noto, ziro
- i swingani …?
- hlayela (kufika eka)
- hlayela kuya emahlweni (kusuka eka, kufika eka)
- hlayela kuya endzhaku (kusuka eka, kufika eka)
- hlayela hi va n'we, va mbirhi … va khume …
- tele, tala, ntsongo, swingariswingani
- ntsongo eka, nkulu eka, tala, ntsongo
- tala kutlula mpimo, ntsongo kutlula mpimo, ringanela, ringanelangi
- xin'wana na xin'wana xa xin'wana
- ntlawa, nhlengelo
- kwalomu ka, ekusuhi na, kwalomu ku fana na
- i swingani swi nga sala, leswi saleke
- ehenhlanyana, ehansinyana

Fananisa na ku landzelelanisa tinomboro

- pananisa, ava, fananisa, xaxameta
- nhlayo yo fana tanihi, swo tala kufika eka
- n'we ehenhla, swimbirhi ehenhla, …
- xin'we ehansi, swimbirhi ehansi, …
- emahlweni ka, endzhaku ka, landzelaka, ekusuhi na, exikarhi ka
- vun'we, vumbirhi, vunharhu … vukhume
- hetelela, emahlweni ka, endzhaku ka

Swa michumu/mitalo **yimbirhi**: kulukumbanyana, tele, kulu, kurile, ntsongo, swingariswingani, ntsongonyana

Swa michumu/mitalo **yinharhu** kumbe ku tlula: nkulukumba eka hinkwaswo, tele kutlula hinkwaswo, nkulu eka hinkwaswo, ntsongo eka hinkwaswo, ntsanana eka hinkwaswo

Tioparexini hi tinomboro

Ku hlanganisa na ku susa

- pananisa, fananisa
- hlanganisa, swin'wana, na
- swin'we, hinkwaswo ka swona
- mbirhihata/hafula
- xin'we xin'wana, swimbirhi swin'wana, …
- i swingani swin'wana ku endla …?
- i swingani swin'wana … kutlula …?
- humesa, susa
- xin'we ehansi, swimbirhi ehansi, …
- i swingani swi nga sala/leswi saleke?
- ku hambana exikarhi ka

Multiplication and division

- bundles, groups of two, three, …
- share fairly/equally
- share, share between/among
- share one/more than one at a time
- is the same as, different from
- how many left over, remaining

Equivalence

- match, compare
- exactly the same
- same as, different from
- makes
- equal to
- equal groups

Estimate

- match, compare
- guess how many; estimate
- nearly, close to
- about the same
- just under, just over
- too many, too few, enough, not enough

Patterns, Functions and Algebra

Pattern is all around us. Children encounter patterns and **sequences** in people's behaviour, in daily routines, days of the week, months of the year, in weather cycles, in music and art, and in their built environment. For example:

- clothes

Figure 54 Patterns in clothes

GLOSSARY

pattern
the regular sequence of objects, movements or events that are repeated in a predictable way

sequence
the particular order in which objects, movements or events follow each other

Ku andzisa na ku avanyisa

- tinyandza, mitlawa ya mbirhimbirhi, nharhunharhu, ...
- avela hindlela leyinene/ku ringana
- avela, avela exikarhi/eswikarhi
- avela xin'we/kutlula xin'we hi nkarhi
- swa fana na, swi hambanile na
- i swingani swi nga sala, leswi saleke

Ndzingano

- pananisa, fananisa
- swi fana kwatsa
- swa fana na, swi hambanile na
- swi endla
- swi ringana na
- mitlawa yo ringana

Kumbetela

- pananisa, fananisa
- vhumba leswaku i swingani; kumbetela
- kwalomu ka, ekusuhi na
- kwalomu ko fana
- ehansinyana, ehenhlanyana
- tala kutlula mpimo, ntsongo kutlula mpimo, ringanerile, ringanelangi

Tipatironi, Tifankixini na Alijebura

Patironi yi hinkwakonkwako kwala hi nga kona. Vana va hlangana na tipatironi na **milandzelelano** eka mahanyelo ya vanhu, eka migingiriko ya siku na siku, masiku ya vhiki, tin'hweti ta lembe, eka mirhendzeleko ya maxelo, eka vuyimbeleri na vutshila, na le ka mbangu wa vona lowu akiweke. Tanihi xikombiso:

- swiambalo

Xifaniso xa 54 Patironi leti nga eka swiambalo

DLILOSARI

patironi
malongolokelo ya ntolovelo ya michumu, mifambafambo kumbe swiendleko leswi swi vuyeleriwaka hi ndlela yo vhumbeka

nandzelelano
nongoloko wo karhi lowu michumu, mifambafambo kumbe swiendleko swi landzelelanaka hayona

- buildings

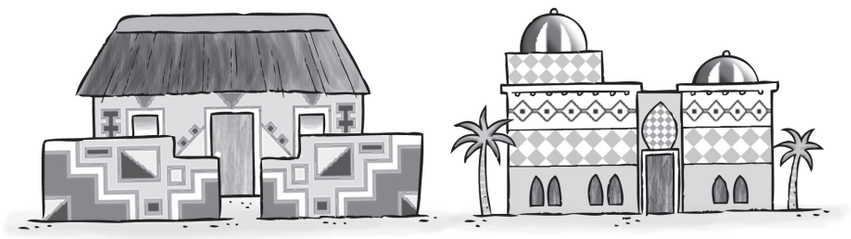


Figure 55 Patterns in buildings

- nature

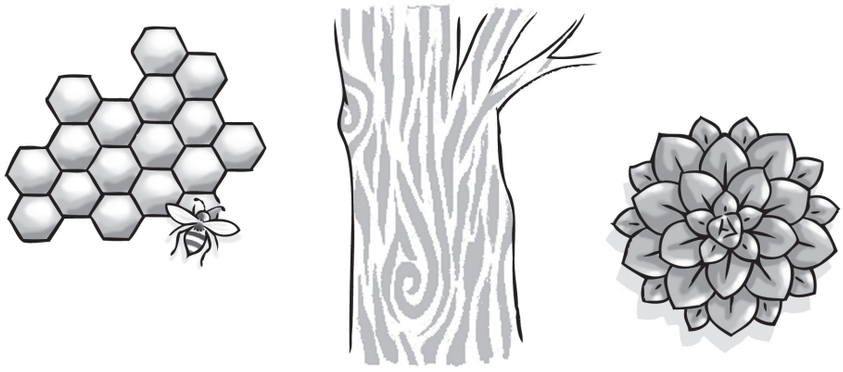


Figure 56 Patterns in nature

Identifying patterns

Young children tend to focus on the colour and attractiveness of a picture or object, e.g. a piece of wrapping paper, and will say it has a 'pretty pattern'. Most of these patterns are **irregular patterns**. We can see that there is a repetition of objects, colours or shapes, but we cannot tell how the repetition works.

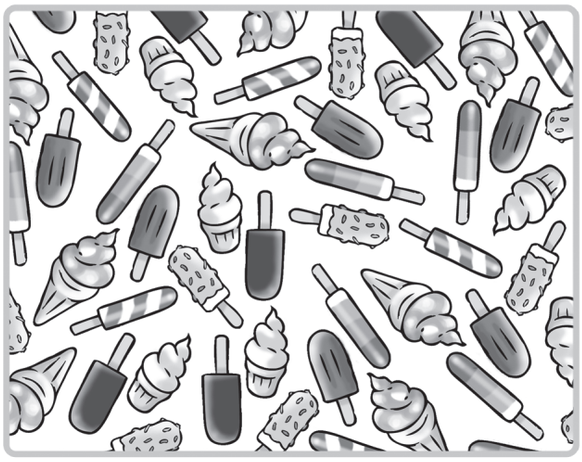
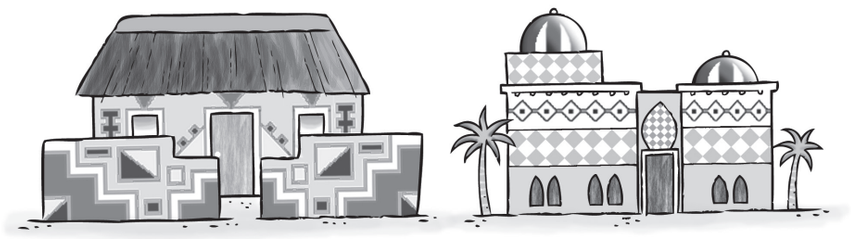


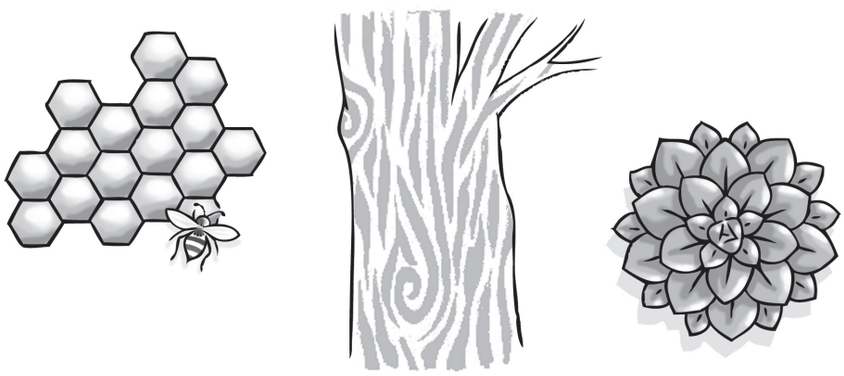
Figure 57 Irregular patterns

- miako



Xifaniso xa 55 Patironi eka miako

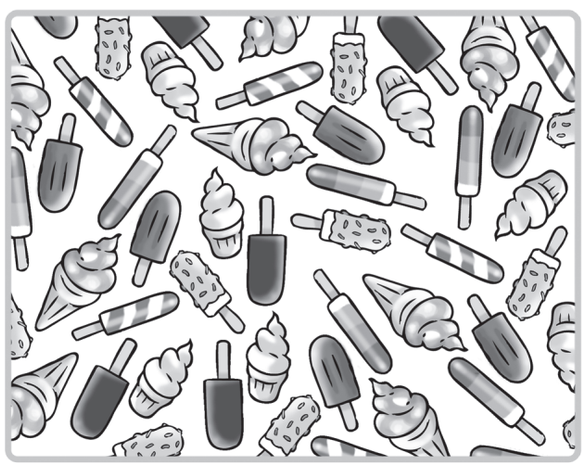
- ntumbuluko



Xifaniso xa 56 Tipatironi eka ntumbuluko

Ku kuma tipatironi

Vana lavatsongo va tala ku kongomisa eka mihlovo na nkokarinoko wa xifaniso kumbe nchumu, xik. xiphemu xa phepha ro phutsela, naswona va ta vula leswaku ri na 'patironi yo saseka'. Vunyingi bya tipatironi i **tipatironi to gombonyoka**. Hi nga kota ku vona leswaku ku na mbuyelelo wa michumu, mihlovo kumbe swivumbeko kambe hi nge swi koti ku hlamusela hilaha mbuyelelo wu tirhaka hakona.



Xifaniso xa 57 Tipatironi to gombonyoka

Teachers should draw learners' attention to patterns inside and outside the classroom. For example, point out how the bricks in a wall are arranged, the paving tiles in a path or the markings on animals.

Figure 58 Patterns around us

In a **regular pattern** we can see how the **elements** in a pattern are repeated and we can predict the order or sequence that the pattern will follow, e.g. in the pattern below we can see that the circle and square are repeated and we can predict that the next shape in the sequence will be a circle, followed by a square, and so on.

GLOSSARY

elements
the objects, movements or events in a pattern

Figure 59 Circle, square pattern

In Grade R, learners may be able to recognise a pattern, but they may not be able to identify or describe 'what makes the pattern'. Teachers can help learners identify patterns by asking them what makes a particular pattern and how the elements are sequenced. For example, in the pattern above: 'Which shape is first? Which shape is next? What shape do you think will come next?'

Different types of patterns

Geometric patterns

A geometric pattern is a pattern that is made of lines and geometric shapes that are arranged in a repeated order, for example, a rhombus, rectangle, square or pentagon. Geometric patterns can be found all around us, e.g. on floor tiles and wrapping paper.

Figure 60 Geometric patterns

Vadyondzisi va fanele ku kongomisa miehleketo ya vadyondzi eka tipatironi leti nga endzeni na le handle ka kamara ro dyondzela. Tanihi xikombiso, komba hilaha switina leswi nga ekhumbini swi veketeriweke hakona, tithayilisi to phevha leti nga endleleni kumbe mavala lama nga eka swifuwo.

Xifaniso xa 58 Tipatironi laha hi nga kona

Eka **patironi yo olova** hi nga kota ku vona hilaha **swiphemu** leswi nga eka patironi swi vuyeleriwaka hakona naswona hi nga kota ku vhumba nandzelelano kumbe malongolokelo lama patironi leyi yi nga ta ma landzelela, xik. eka patironi leyi nga laha hansi hi nga kota ku vona leswaku xirhendzevutana na xikwere swa vuyeleriwa naswona hi nga kota ku vhumba leswaku xivumbeko lexi landzelaka eka malongolokelo ku ta va xirhendzevutana, xi landzeriwa hi xikwere, na swo kota sweswo.

DLILOSARI

swiphemu
michumu, mifambafambo kumbe swiendleko leswi nga eka patironi

Xifaniso xa 59 Patironi ya xirhendzevutana, xikwere

Eka Giredi ya V, vadyondzi va nga ha kota ku lemuka patironi kambe va nga ka va nga koti ku kuma kumbe ku hlamusela 'leswi swi endlaka patironi'. Vadyondzisi va nga pfuna vadyondzi ku komba tipatironi hi ku va vutisa leswaku i yini swi endlaka patironi yo karhi na hilaha swiphemu swi longoloxiweke hakona. Tanihi xikombiso, eka patironi leyi nga laha henhla: 'Xana i xivumbeko xihi xi nga rhanga? Xana i xivumbeko xihi xi landzelaka? Xana i xivumbeko xihi u ehleketaka leswaku xi ta landzela?

Mixaka yo hambanahambana ya tipatironi

Tipatironi ta jometiri

Patironi ya jometiri i patironi leyi yi endliweke hi mitila na swivumbeko swa jometiri leswi swi veketeriweke hi nandzelelano lowu vuyeleriweke, tanihi xikombiso, rhombasi, yinhlamune, xikwere kumbe yinhlantlhanu. Tipatironi ta jometiri ti nga kumeka hinkwakonkwako kwala kusuhi na hina, xik. tithayilisi ta le hansi na maphepha yo phutsela.

Xifaniso xa 60 Tipatironi ta jometiri

Repeating patterns

Repeating patterns are made up of a repeated sequence of elements, for example, shapes, colours, sounds, objects, movement or events. In a repeating pattern, the same elements are repeated regularly.

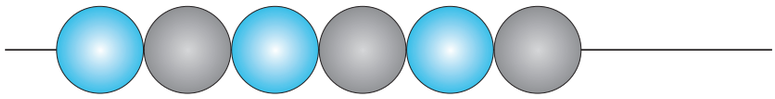


Figure 61 AB pattern

Start by introducing learners to patterns with only one **attribute** that differs, e.g. colour or shape, and provide a long enough repeat sequence so that learners can work out the pattern.

Learners can then recognise more challenging patterns, such as ABB or AABB patterns.

GLOSSARY

attribute
a feature or characteristic of something, for example, colour or shape

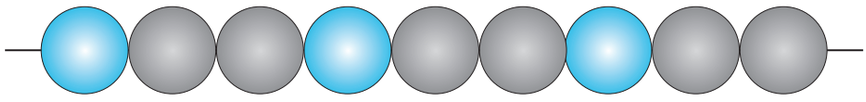


Figure 62 ABB pattern

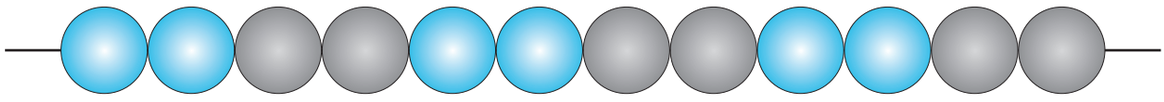


Figure 63 AABB pattern

Gradually introduce learners to patterns that have two or more attributes, such as colour and shape.

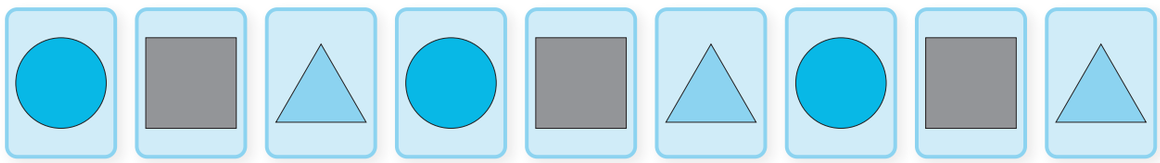


Figure 64 ABC pattern

Growing patterns

Growing patterns are different from repeating patterns in that the pattern increases or decreases in size in each sequence. In the pattern in Figure 65, the number of coloured blocks increases by one in each sequence of blocks.

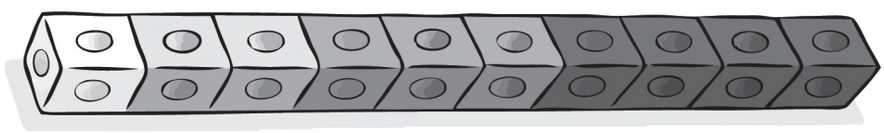
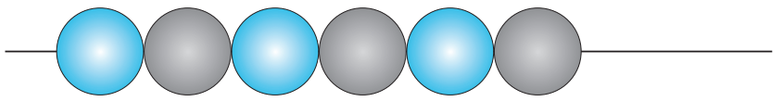


Figure 65 Growing pattern

Tipatironi leti vuyelelaka

Tipatironi leti vuyelelaka ti endliwe hi malongolokelo ya swiphemu leswi vuyeleriweke, tanihi xikombiso, swivumbeko, mihlovo, mipfumawulo, michumu, mifambafambo kumbe swiendleko. Eka patironi leyi vuyelelaka, swiphemu swo fana swi vuyelela nkarhi na nkarhi.



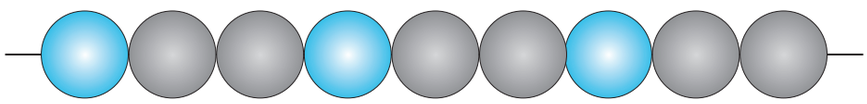
Xifaniso xa 61 Patironi ya AB

Sungula hi ku tivisa vadyondzi tipatironi leti nga na **xihlawulekisi** xin'we ntsena lexi xi hambanaka, xik. muhlovo kumbe xivumbeko, na ku nyika malongolokelo yo vuyelela yo leha ku ringanela ku endlela leswaku vadyondzi va kota ku tirha patironi leyi.

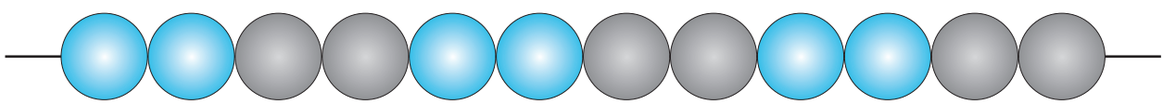
Vadyondzi se va nga lemuka tipatironi to tlhontlha to tala, to tanihi hi tipatironi ta ABB kumbe AABB.

DLILOSARI

xihlawulekisi
xikombo kumbe xihlawulekisi xa xin'wana, tanihi xikombiso, muhlovo kumbe xivumbeko

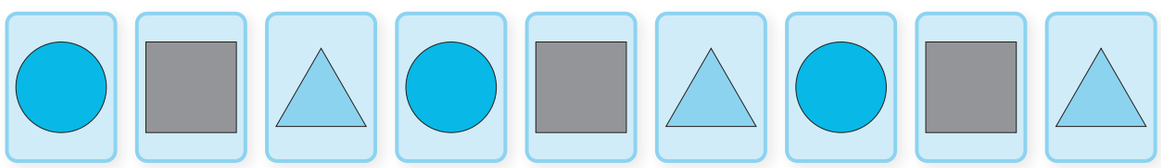


Xifaniso xa 62 Patironi ya ABB



Xifaniso xa 63 Patironi ya AABB

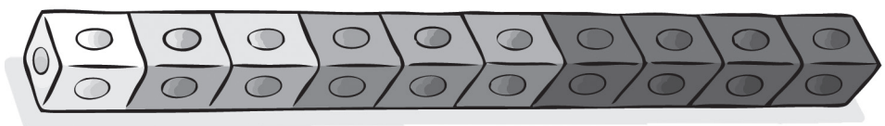
Hi katsongotsongo tivisa vadyondzi tipatironi leti ti nga na swihlawulekisi swimbirhi kumbe kutlula, swo tanihi muhlovo na xivumbeko.



Xifaniso xa 64 Patironi ya ABC

Tipatironi leti kulaka

Tipatironi leti kulaka ti hambanile na tipatironi leti vuyelelaka hikuva eka leyi patironi ya engetela kumbe yi hunguteka hi sayizi eka malongolokelo man'wana na man'wana. Eka patironi leyi nga eka Xifaniso xa 65, nhlayo ya tibuloko leti hlovohatiweke yi engetela hi n'we eka malongolokelo man'wana na man'wana ya tibuloko.



Xifaniso xa 65 Patironi leyi kulaka

Learners can associate the pattern with the sequence of numbers and recognise that the number increases by one each time.

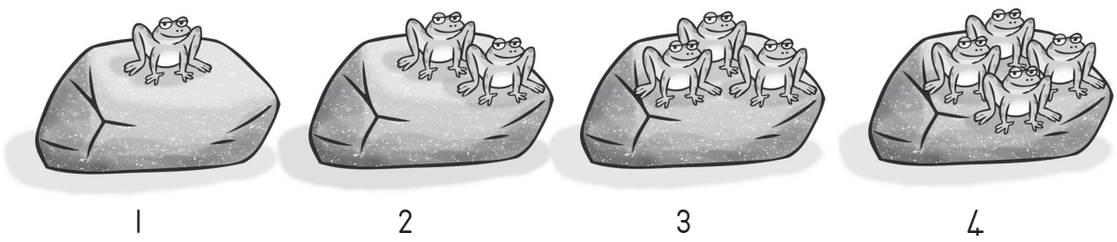


Figure 66 Growing pattern

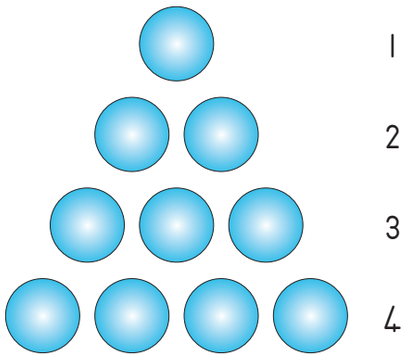


Figure 67 Growing pattern

In the pattern below, the sequence increases by two each time.

Figure 68 Growing pattern

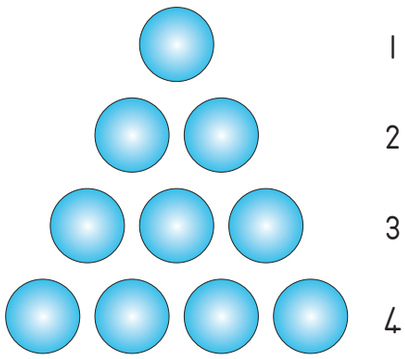
Patterning skills – what learners need to know

Learners' skills will vary, but generally Grade R learners will work towards being able to:

- match and sort objects according to one or more attribute, e.g. shape, colour, sound
- compare similarities and differences in two or more objects
- talk about patterns that arise from daily experiences
- recognise patterns in their environment, e.g. fence posts, bricks, paving
- identify patterns
- copy patterns that others have made
- extend patterns that others have started

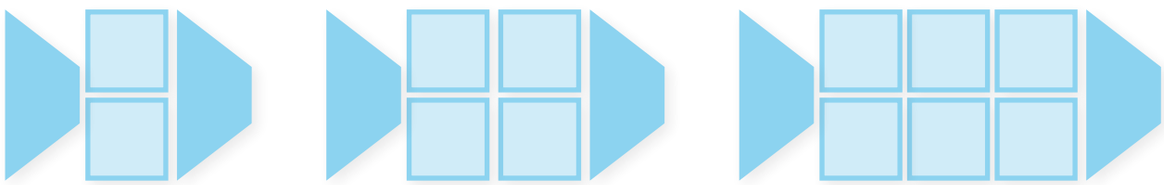
Vadyondzi va nga fambelanisa patironi na malongolokelo ya tinomboro na ku lemuka leswaku nomboro ya engetela hi n'we nkarhi wun'wana na wun'wana.

Xifaniso xa 66 Patironi leyi kulaka



Xifaniso xa 67 Patironi leyi kulaka

Eka patironi leyi nga laha hansi, malongolokelo ya engetela hi mbirhi nkarhi wun'wana na wun'wana.



Xifaniso xa 68 Patironi leyi kulaka

Swikili swa ku endla tipatironi – leswi vadyondzi va faneleke ku swi tiva

Swikili swa vadyondzi swi ta hambana kambe hi ku angarhela vadyondzi va Giredi ya V va ta tirha ku kota ku:

- pananisa na ku ava michumu hi ku ya hi xihlawulekisi xin'we kumbe kutlula, xik. xivumbeko, muhlovo, mpfumawulo
- fananisa ku fanana na ku hambana eka michumu yimbirhi kumbe kutlula
- vulavula hi mayelana na tipatironi leti ti tumbulukaka eka mitokoto ya siku na siku
- lemuka tipatironi leti nga eka mbangu wa vona, xik. tiphuphu ta darata, switina na maphevhelo
- komba tipatironi
- kopunula tipatironi leti van'wana va ti endleke
- ndlandlamuxa tipatironi leti van'wana va ti sunguleke

- create their own patterns at various levels of difficulty such as:

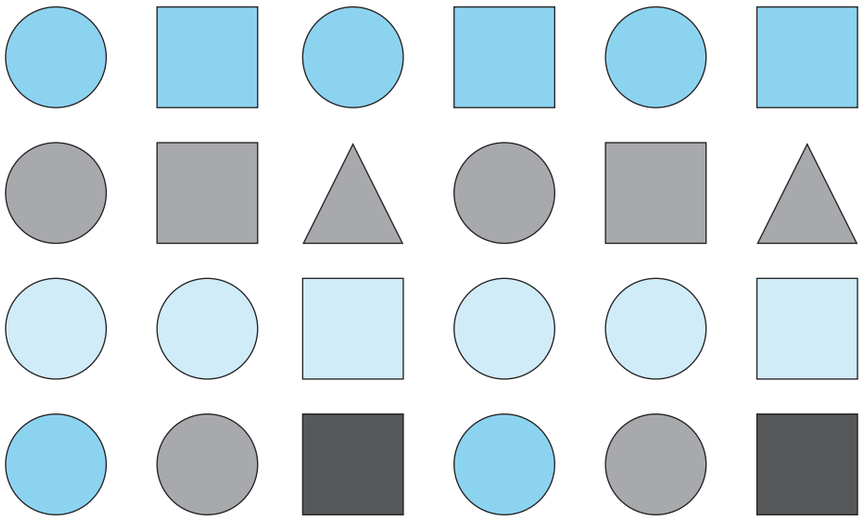


Figure 69 Creating patterns

- tell what is missing if part of a pattern is hidden.

In practice ...

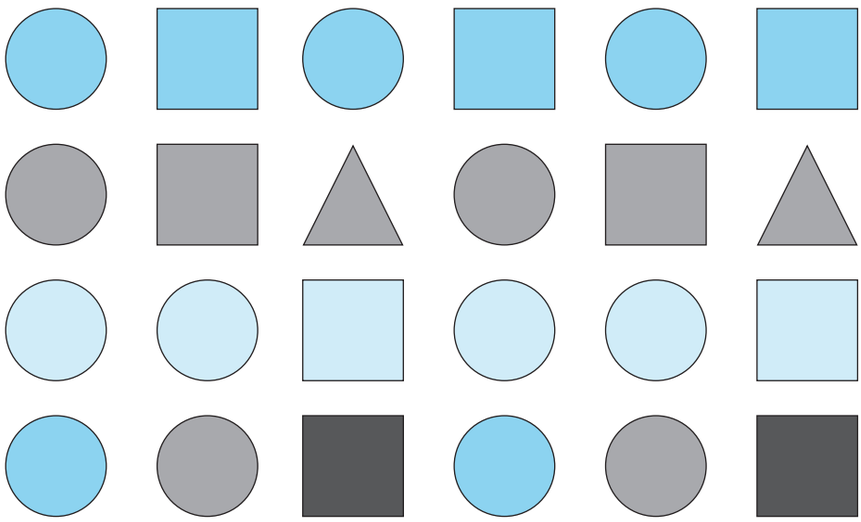
Teachers should guide learners to recognise and make patterns and provide opportunities for them to observe, describe and discuss patterns, focusing on activities that involve:

- talking about 'what makes the pattern'
- exploring patterns using objects, pictures and rhythm, such as clapping, in the maths focus time as well as in creative art, music and physical activities outdoors
- making their own patterns and talking about how and why they have sequenced elements in a particular way
- drawing patterns and using different colours and shapes, and to talk about the way the pattern is repeated.

Questions to ask for Patterns, Functions and Algebra

- Can you see a pattern? Tell me about it.
- What comes first, last, next, after, before?
- Are these two patterns the same? What is different? How could you make them the same?
- Can you copy this pattern? What will come next in the pattern?
- What must I do to extend this pattern?
- Can you tell me what your pattern is? Could you make a different pattern? What is missing in this pattern?

- tumbuluxa tipatironi ta vona vini eka tilevhele to hambanahambana ta matikelo to tanihi:



Xifaniso xa 69 Ku tumbuluxa tipatironi

- vula leswi swi kayivelaka loko xiphemu xa patironi xi tumbetiwile.

Eka maendlelo ...

Vadyondzisi va fanele ku letela vadyondzi ku lemuka na ku endla tipatironi na ku va nyika mikarhi ya ku xiyaxiya, ku hlamusela na ku kanela tipatironi, va ri karhi va kongomisa eka migingiriko leyi yi khumbaka:

- ku vulavula hi mayelana na 'leswi swi endlaka patironi'
- ku valanga tipatironi hi ku tirhisa michumu, swifaniso na ncino, swo tanihi hi ku phokotela, eka nkarhi wa nkongomo wa metse xikan'we na le ka vutshila byo tumbuluxa, vuyimbeleri na migingiriko ya le handle ka miako ya ku tirhisa swirho swa miri
- ku endla tipatironi ta vona vini na ku vulavula hi mayelana na hilaha va longoloxeke hakona swiphemu na leswaku hikwalahokayini va swi longoloxile hi ndlela yo karhi
- ku dirowa tipatironi na ku tirhisa mihlovo na swivumbeko swo hambanahambana, na ku vulavula hi mayelana na hilaha patironi yi vuyeleriweke hakona.

Swivutiso leswi faneleke ku vutisiwa eka Tipatironi, Tifankixini na Alijebura

- Xana wa kota ku vona patironi? Ndzi byele hi mayelana na yona.
- Xana i yini xi taka kusungula, ro hetelela, lexi landzelaka, endzhaku, emahlweni?
- Xana tipatironi letimbirhi ta fana? Xana ku hambanile yini? Xana u nga ti endla njhani ti fana?
- Xana u nga kota ku kopunula patironi leyi? Xana i yini lexi nga ta landzela eka patironi leyi?
- Xana ndzi boheka ku endla yini ku ndlandlamuxa patironi leyi?
- Xana u nga ndzi byela leswaku patironi ya wena i yini? Xana u nga kota ku endla patironi yo hambana? Xana ku kayivela yini eka patironi leyi?

Vocabulary for Patterns, Functions and Algebra

- match, compare, order, sequence
- start, beginning
- first, middle, last
- before, after, end
- which is next …?
- size
- big, bigger, biggest
- small, smaller, smallest
- same, different, difference
- colour names
- build the pattern
- recognise
- show, identify
- continue, carry on, extend
- copy
- repeat, again
- describe, explain
- what comes before/after?
- follows, between
- in a line, in a row
- space, spaced

Space and Shape (Geometry)

Young children explore shape and space during their everyday activities as they try to make sense of the forms and shapes around them, such as their mother's face, objects that move and their own bodies. They explore spatial concepts related to shape and space when they play with balls or get in and out of boxes and climb onto and under objects. They have observed different shapes in things in their homes and outside, such as clouds, buildings, leaves and vehicles.

Many children come to Grade R with some knowledge of different shapes and may be able to identify and draw shapes, such as circles and triangles. They may also have played with blocks, construction toys and puzzles. In Grade R, learners build on these experiences as they learn about space, shape, position, **orientation**, views and direction. They need plenty of opportunities to investigate and explore different everyday objects. These experiences of space and shape help to lay a solid foundation for understanding **geometry** in later grades.

GLOSSARY

orientation
how objects are placed in relation to each other

geometry
an aspect of mathematics that deals with properties, measurement and relationships of points, lines and angles of shapes in space

Ntivomarito wa Tipatironi, Tifankixini na Alijebura

- pananisa, fananisa, xaxameta, longoloxa
- sungula, masungulo
- xa vun'we, exikarhi, xo hetelela
- emahlweni, endzhaku, emakumu
- hi xihi xi landzelaka …?
- sayizi
- nkulu, nkulunyana, nkulu kutlula hinkwaswo
- ntsongo, ntsongonyana, ntsongo kutlula hinkwaswo
- fana, hambana, ku hambana
- mavito ya mihlovo
- aka patironi
- lemuka
- komba, kuma
- yisa emahlweni, yana emahlweni, ndlandlamuxa
- kopunula
- vuyelela, nakambe
- hlamusela, kombisa
- hi xihi xi taka emahlweni/endzhaku?
- landzelaka, exikarhi ka
- elayinini, erixaxeni
- ndhawu, vangwa

Ndhawu na Xivumbeko (Jometiri)

Vana lavatsongo va valanga xivumbeko na ndhawu hi nkarhi wa migingiriko ya vona ya masiku hinkwawo tanihi loko va ri karhi va ringeta ku twisisa mixaka na swivumbeko leswi nga ekusuhi na vona, swo tanihi xikandza xa mana wa vona, michumu leyi fambaka na miri ya vona vini. Va valanga minongoti ya ndhawu leyi fambelanaka na xivumbeko na ndhawu loko va tlanga hi tibolo kumbe loko va nghena kumbe va huma emabokisini na ku khandziya ehenhla na ku khokhomela ehansi ka michumu. Va xiyaxiya swivumbeko swo hambanahambana leswi nga eka swilo leswi nga emakaya ya vona na le handle, swo tanihi mapapa, miako, matluka na swipandzamananga.

Vana vo tala va ta eka Giredi ya V va ri na vutivi bya swivumbeko swo hambanahambana naswona va nga ha kota ku kuma na ku dirowa swivumbeko swo tanihi swirhendzevutana na tinhlanharhu. Va nga va va tlangile hi tibuloko, switlangiso swo maka na swiphazamiso. Eka Giredi ya V, vadyondzi va aka ehenhla ka mitokoto leyi loko va ri karhi va dyondza hi mayelana na ndhawu, xivumbeko, xiyimo, **vonakelo**, malangutekelo na tlhelo. Va lava mikarhi yo tala ku lavisisa na ku valanga michumu ya masiku hinkwawo. Mitokoto leyi ya ndhawu na xivumbeko yi pfuna ku vumba masungulo yo tiya ya ku twisisa **jometiri** eka tigiredi leti landzelaka.

DLILOSARI

vonakelo
hilaha michumu yi vekiweke hakona ku ya hi mfambelano wa yona vini

jometiri
xiphemu xa matematiki lexi xi tirhanaka na swihlawulekisi, mipimo na vuxaka bya vutontswi, mitila na tinhla ta swivumbeko eka ndhawu

Space

Children orientate themselves in space using their own bodies. First they explore the relationship between themselves, other people and objects. Babies reach and grasp objects near to them, and then gradually start to move around and explore their environment using all their senses. They explore what happens when they push, pull, roll or turn different objects as they play with them, and when they do this they develop a sense of themselves in relation to the objects. They also learn the limitations of their own physical movement as they climb over and under chairs, into boxes, hide behind trees or look down from steps.

Position

Position in Grade R starts with the positions of objects in relation to the learner, and progresses to the position of objects in relation to other objects. Position vocabulary includes in, on, above, in front of, behind, in between, next to, and so on.

With the help of adults at home and teachers at school, Grade R learners can develop the vocabulary to describe space, position and direction as they play, look for objects or climb into and onto things.

In practice ...

There are many opportunities during the day for learners to think spatially and to use position vocabulary:

- in games
- when putting things away during tidy-up time
- when lining up
- when talking about where things are in pictures and stories.

To allow learners to explore their movements:

- create an obstacle course inside or outside using chairs, tyres, boxes and/or planks
- act out stories that use maths vocabulary about position, e.g. over and under, up and down, near and far, beside and between
- place objects in different positions and orientations
- ask learners to look at objects from different positions (view) and say what they see.

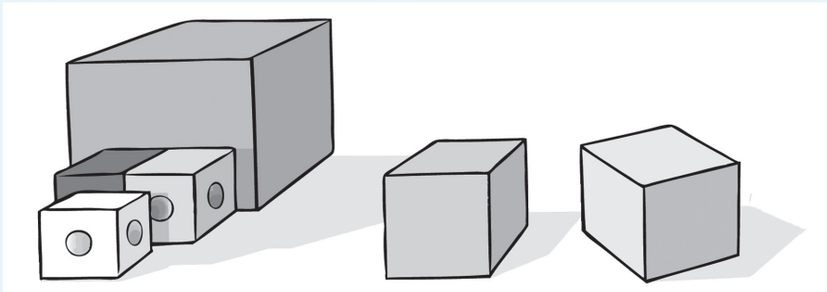


Figure 70 Exploring position

Ndhawu

Vadyondzi va titivisa hi voxe endhawini hi ku tirhisa miri ya vona vini. Xosungula va valanga vuxaka exikarhi ka vona vini, na vanhu van'wana na michumu yin'wana. Tincece ti fikelela na ku khoma michumu leyi nga ekusuhi na tona, kutani endzhaku ka swona hi katsongotsongo ti fambafamba hinkwakonkwako na ku valanga mbangu wa tona hi ku tirhisa switwi swa tona hinkwaswo. Ti valanga leswi humelelaka loko ti susumeta, ti koka, ti khunguluxa kumbe ku hundzuluxela michumu yo hambanahambana loko ti ri karhi ti tlanga hi yona, naswona loko ti ri karhi ti endla leswi ti ndlandlamuxa ntwisiso wa tona vini hi mayelana na michumu leyi. Ti tlhela ti dyondza mipimo ya mfambafambo wa miri wa tona vini loko ti ri karhi ti khandziya ehenhla na ku khokhomela ehansi ka switulu, ti nghena emabokisini, ti tumbela endzhaku ka misinya kumbe ku languta ehansi kusuka ehenhla ka switepisi.

Xiyimo

Xiyimo eka Giredi ya V xi sungula hi swiyimo swa michumu hi ku fambelana na mudyondzi, naswona swi hundzela eka xiyimo xa michumu hi ku fambisana na michumu yin'wana. Ntivomarito wa xiyimo wu katsa endzeni, eka, ehenhla ka, emahlweni ka, endzhaku ka, exikarhi ka, ekusuhi na, na swo kota sweswo.

Hi ku pfuniwa hi vatswatsi ekaya na vadyondzisi exikolweni, vadyondzi va Giredi ya V va nga hluvukisa ntivomarito ku hlamusela ndhawu, xiyimo na matlhelo loko va ri karhi va tlanga, va lava michumu kumbe va khokhomela na ku khandziya swilo.

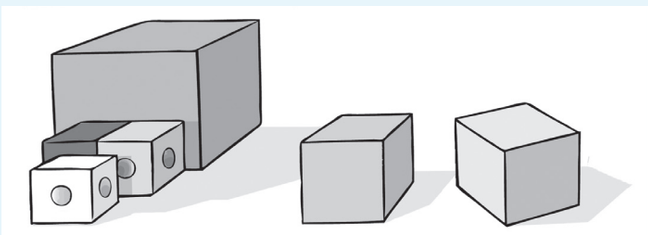
Eka maendlelo ...

Ku na swivandlanene swo tala esikwini laha vadyondzi va ehleketaka hi vundhawu na ku tirhisa ntivomarito wa xiyimo:

- eka mitlangu
- loko va veka swilo hi nkarhi wo basisa
- loko va fola layini
- loko va vulavula hi mayelana na laha swilo swi nga kona eswifanisweni na le switorini.

Ku pfumelela vadyondzi ku valanga mifambafambo ya vona:

- tumbuluxa ntlangu wa swihingakanyo endzeni kumbe ehandle hi ku tirhisa switulu, mathayere, mabokisi na/kumbe mapulangi
- tlangani switori leswi swi tirhisaka ntivoririmi wa metse hi mayelana na xiyimo, xik. ehenhla ka na ehansi ka, ehenhla na ehansi, ekusuhi na ekule, etlhelo ka na exikarhi ka
- veka michumu eka swiyimo swo hambanahambana na le ka mavonakelo yo hambanahambana
- kombela vadyondzi ku languta michumu kusuka eka swiyimo (matlhelo) swo hambanahambana kutani va vula leswi va swi vonaka.



Xifaniso xa 70 Ku valanga xiyimo

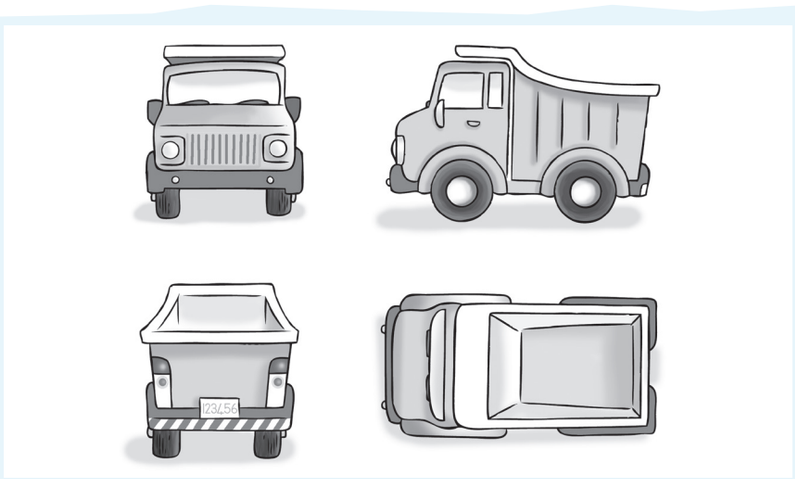


Figure 71 Different orientations

Direction

Learners in Grade R initially begin to show direction by pointing, then by using simple phrases like 'over there'. The concept of direction progresses from being about the position of where children are to where they are in relation to other things, e.g. go straight, turn, and so on.

In practice ...

Use direction vocabulary:

- during snack and tidy-up time
- when giving instructions about where to put things and how to get from one place to another
- when going on outings.

Perspective

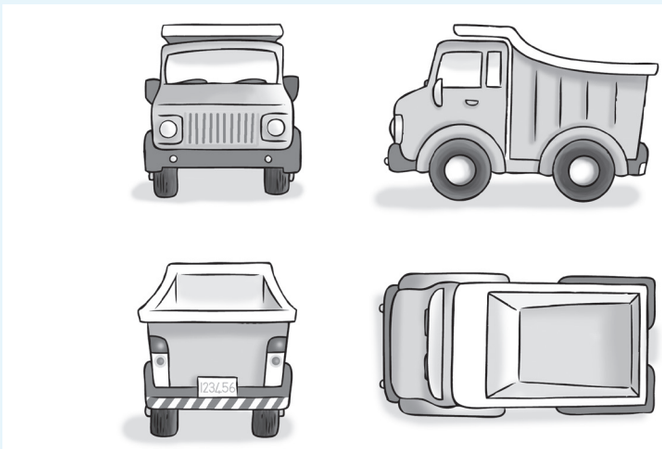
In Grade R, as learners' gain an increased understanding that when things are far away they look smaller, their concept of **perspective** develops.

In practice ...

- Observe people and objects outside the classroom and talk about why they look smaller.
- Close one eye and measure how big a person or object looks and talk about whether they are really that small.
- Focus attention on objects in pictures that appear to be small and talk about why this is so.

GLOSSARY

perspective
the effect of distance or depth on the appearance of objects



Xifaniso xa 71 Mavonakelo yo hambanahambana

Tlhelo

Ekusunguleni vadyondzi va Giredi ya V va sungula ku komba tlhelo hi ku kombetela, endzhaku ka swona hi ku tirhisa swivulwahava swo olova swo fana na 'lahaya'. Nongoti wa tlhelo wu ya emahlweni kusuka eka ku va hi mayelana na xiyimo laha vana va nga kona kuya laha va nga kona hi ku fambelana na swilo swin'wana, xik. famba thwi, jika, na swo kota sweswo.

Eka maendlelo ...

Tirhisa ntivomarito wa tlhelo:

- hi nkarhi wa swinambunambu na wo basisa
- loko u nyika swileriso hi mayelana na laha ku nga vekiwaka kona swilo na hilaha u nga fambaka hakona kusuka eka ndhawu yin'wana kuya eka yin'wana
- loko mi tihumesa.

Ndzemuko

Eka Giredi ya V, tanihiloko vadyondzi va ri karhi va kuma ntwisiso wa leswaku loko swilo swi ri ekule swi languteka swi ri leswitsongonyana, nongoti wa vona wa **ndzemuko** wa kula.

DLILOSARI

ndzemuko
nkucetelo wa mpfhuka kumbe vuenti eka mavonakelo ya michumu

Eka maendlelo ...

- Xiyaxiya vanhu na michumu ehandle ka kamara ro dyondzela kutani mi vulavula hi mayelana na leswaku hikwalahokayini swi languteka swi ri leswitsongo.
- Pfala tihlo rin'we kutani mi pima hilaha munhu kumbe nchumu wu langutekaka wu ri wukulu hakona kutani mi vulavula hi mayelana na loko swi ri leswitsongo hakunene.
- Kongomisa miehleketo eka michumu leyi nga eswifanisweni leyi yi vonakaka yi ri yitsongo kutani mi vulavula hi mayelana na leswaku hikwalahokayini leswi swi ri tano.

Shape

In Grade R, learners focus on recognising, identifying and naming **3-dimensional (3-D)** objects and **2-dimensional (2-D)** shapes. In everyday language, learners will say that they can look at the object from all sides, the top and the bottom. Mathematically we describe the **properties** of 3-D objects by their length, breadth (width) and height. In everyday language, learners will talk about 2-D shapes as pictures, but mathematically we talk about shapes as having length and breadth (width) to describe two dimensions.

Three-dimensional (3-D) objects

In Grade R, learners explore the properties of everyday 3-D objects. They build constructions using recycled household materials, such as boxes, cans, tubs, toilet roll inners and balls. They investigate and describe box- and ball-shaped objects. They compare and sort objects, and talk about similarities and differences.

GLOSSARY

2-dimensional (2-D)
a shape has two dimensions: length and breadth (width)

3-dimensional (3-D)
an object has three dimensions: length, breadth (width) and height

property
the characteristics of a 2-D shape or 3-D object, e.g. length, width, height, sides (faces), edges, corners

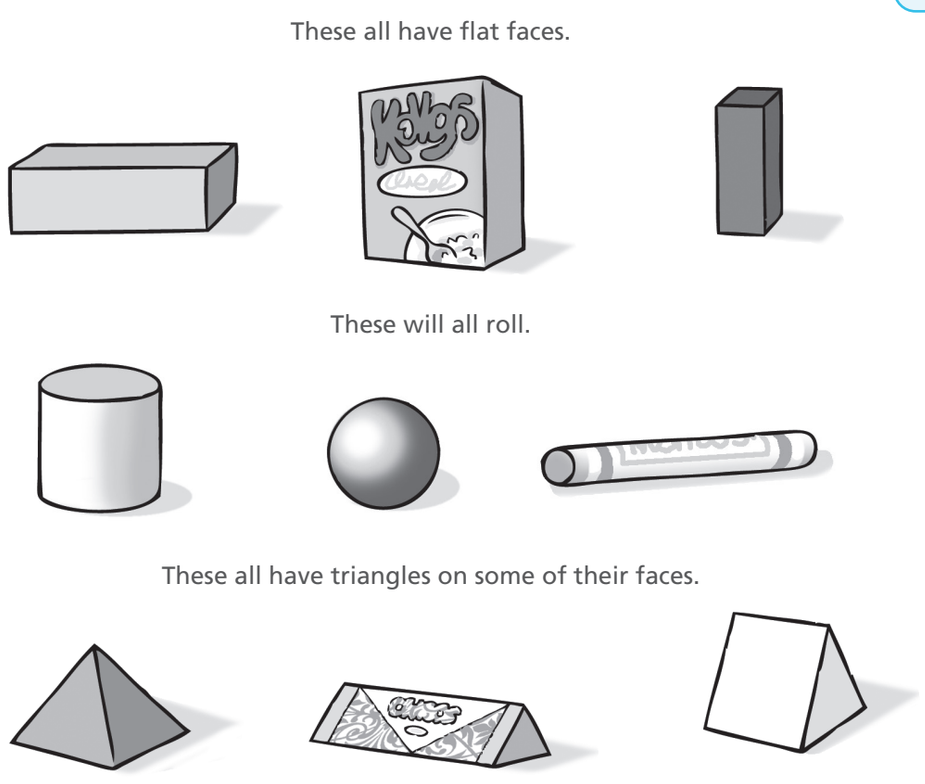


Figure 72 3-D objects

Xivumbeko

Eka Giredi ya V, vadyondzi va kongomisa eka ku lemuka, ku kuma na ku vula mavito ya michumu ya **matlhelo ma3 (3-D)** na swivumbeko swa **matlhelo ma2 (2-D)**. Eka ririmi ra masiku hinkwawo, vadyondzi va ta vula leswaku va nga kota ku languta nchumu kusuka eka matlhelo hinkwawo, ehenhla na le hansi. Hi ku ya hi ximatematiki hi hlamusela **swihlawulekisi** swa michumu ya 3-D hi vulehi bya swona, vuanami (anama) na vulehelahenhla. Eka ririmi ra masiku hinkwawo, vadyondzi va ta vulavula hi mayelana na swivumbeko swa 2-D tanihi swifaniso, kambe hi ku ya hi ximatematiki hi vulavula hi mayelana na swivumbeko tanihileswi swi nga na vulehi na vuanami (anama) ku hlamusela matlhelo mambirhi.

Michumu ya matlhelo manharhu (3-D)

Eka Giredi ya V, vadyondzi va valanga swihlawulekisi swa michumu ya 3-D ya masiku hinkwawo. Va aka swimakiwa hi ku tirhisa swo aka hi swona swa le makaya leswi vuyelerisiweke swo tanihi mabokisi, swikotela, timfuku, switsondzelelo swa phepha ra le xihambukelweni na tibolo. Va lavisisa na ku hlamusela swilo swa swivumbeko swa bokisi na swa xa bolo. Va fananisa na ku ava michumu, na ku vulavula hi mayelana na ku fanana na ku hambana.

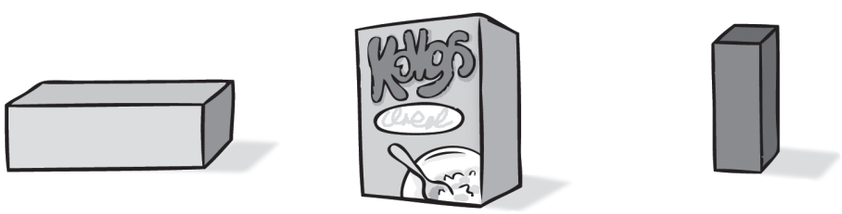
DLILOSARI

matlhelo ma2 (2-D)
xivumbeko xi na matlhelo mambirhi: vulehi na vuanami (anama)

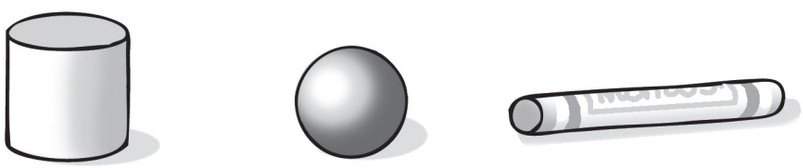
matlhelo ma3 (3-D)
nchumu wu na matlhelo manharhu: vulehi, vuanami (anama) na vulehelahenhla

xihlawulekisi
swihlawulekisi swa xivumbeko xa 2-D kumbe nchumu wa 3-D, xik. vulehi, vuanami, vulehelahenhla, matlhelo (swikandza), makumu, tikhona

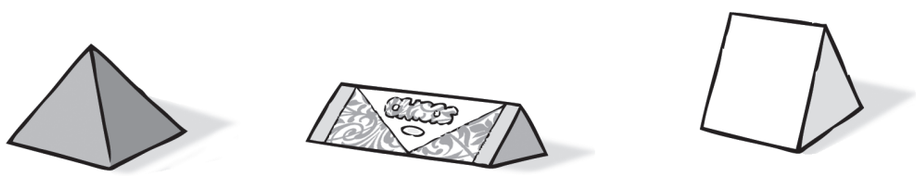
Leswi hinkwaswo swi na swikandza swo patlama.



Leswi hinkwaswo swi ta khunguluka.



Leswi hinkwaswo swi na tinhlanharhu eka swin'wana swa swikandza swa swona.



Xifaniso xa 72 Michumu ya 3-D

In practice ...

Learners can:

- Play with collections of 3-D objects including blocks, tins, boxes and balls.
- Describe objects. They can choose one object at a time. You can prompt their thinking through questioning, and introduce them to the correct names and properties of each object.
- Sort 3-D objects according to a particular property, such as straight edges or whether they can roll. This will allow learners to become familiar with, and to explore the properties of the objects.
- Describe these objects using everyday language, such as flat, smooth, pointy. As learners notice more properties they learn the appropriate names, e.g. edge, corner, surface or base, face. Sorting activities and discussions about objects are important because they help learners to understand, for example, that although a cardboard tube is tall and thin, while a drink can is much shorter, they are both cylinders.

Learners should be guided to recognise that it is the property of an object, such as the length, breadth or height, that we are focusing on when sorting and not the colour, size or other features.

Grade R learners may ask what the name of an object is, e.g. a cube, cylinder or cone. In higher grades learners learn about the 3-D solids shown in Figure 73.

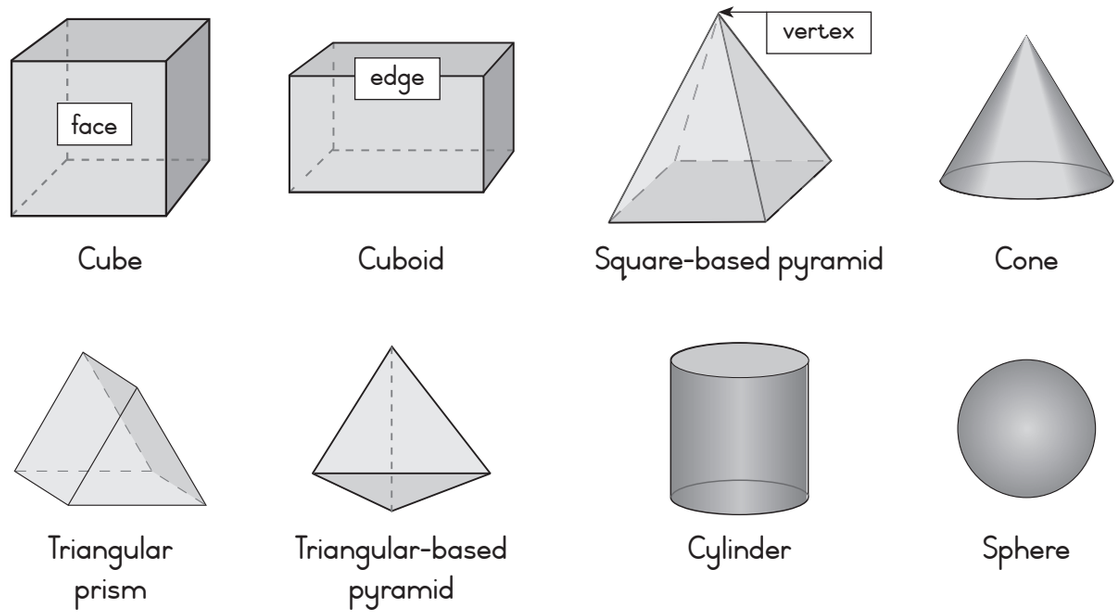


Figure 73 3-D solids

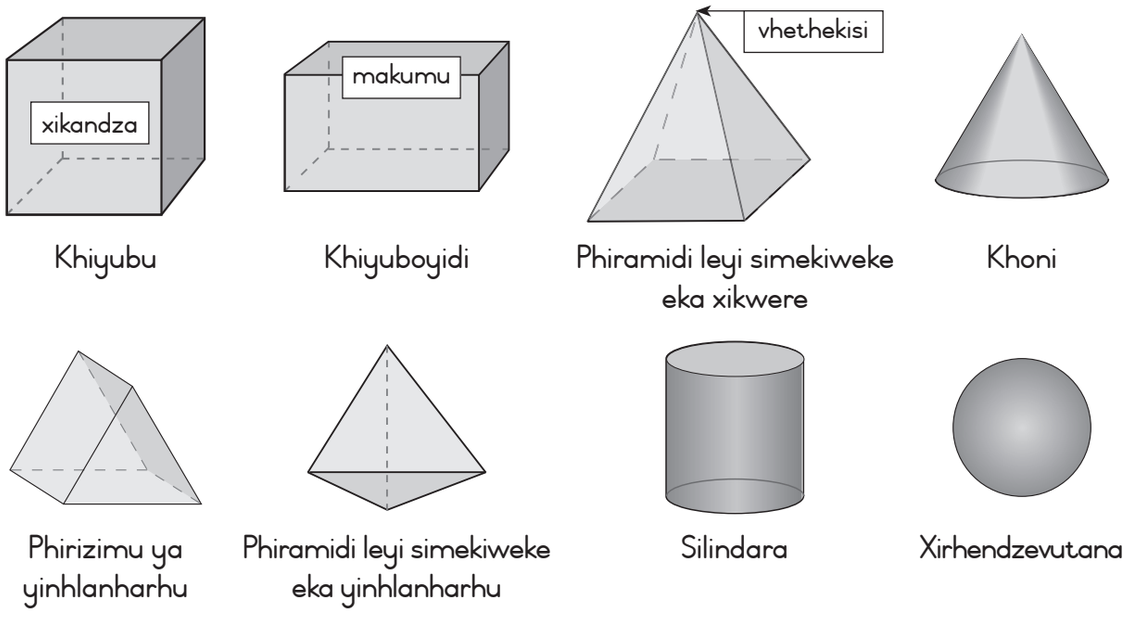
Eka maendlelo ...

Vadyondzi va nga:

- Tlanga hi mihlengelo ya michumu ya 3-D ku katsa na tibuloko, swikotela, mabokisi na tibolo.
- Hlamusela michumu. Va nga hlawula nchumu wun'we hi nkarhi. U nga tlhontlha miehleketo ya vona hi ku va vutisa na ku va tivisa mavito lama nga lulama na swihlawulekisi swa nchumu wun'wana na wun'wana.
- Ava michumu ya 3-D hi ku ya hi xihlawulekisi xo karhi, kufana na makumu yo thwixama kumbe loko swi nga kota ku khunguluka. Leswi swi ta pfumelela vadyondzi ku tiva, na ku valanga swihlawulekisi swa michumu leyi.
- Hlamusela michumu leyi hi ku tirhisa ririmi ra masiku hinkwawo ro tanihi swo patlama, swo rhetela, swo tontswa. Loko vadyondzi va ri karhi va tiva swihlawulekisi swo tala va dyondza mavito lama nga fanela, xik. makumu, khona, hansi kumbe tshaku, xikandza. Migingiriko yo ava na mikanelo hi mayelana na michumu i swa nkoka hikuva swi pfuna vadyondzi ku twisisa, tanihi xikombiso, leswaku hambileswi thumbu ra khadibokisi ri nga leha na ku lala na leswi xikotela xa kholidirinki xi nga koma swinene, havumbirhi i swa silindara.

Vadyondzi va fanele ku leteriwa ku lemuka leswaku i xihlawulekisi xa nchumu, xo tanihi vulehi, vuanami kumbe vulehelahenhla, leswi hi kongomisaka eka swona loko hi ava naswona ku nga ri muhlovo, sayizi kumbe swihlawulekisi swin'wana.

Vadyondzi va Giredi ya V va nga ha vutisa leswaku i mani vito ra nchumu lowu, xik. khiyubu, silindara kumbe khoni. Eka tigiredi ta le henhla vadyondzi va dyondza hi mayelana na switiyi swa 3-D leswi kombiweke eka Xifaniso xa 73.



Xifaniso xa 73 Switiyi swa 3-D

Two-dimensional (2-D) shapes

In Grade R, learners recognise, identify and name 2-D shapes: circles, triangles, squares and rectangles. Inside and outside the classroom they see shapes and can explore the properties of these shapes in pictures and look for objects that 'look like' shapes, e.g. a road sign might look like a circle, the windowpane like a square, the door like a rectangle.

In practice ...

Learners can:

- Explore the properties of 2-D shapes inside and outside the classroom, such as circles, squares, rectangles and triangles.
- Look for objects that have a 'square' shape, referring to the side or face of a box, or a 'circle' shape, referring to a road sign or the base or edge of a cup.
- Describe 2-D shapes of various sizes and orientations in pictures.

Learners need to see a variety of 2-D shapes, e.g. different triangles (not just equilateral ones), and rectangles of different sizes. This helps the learners realise what particular shapes have in common, for example, that all triangles have three sides and three corners, but may not look exactly the same, and that rectangles have four sides regardless of the orientation.

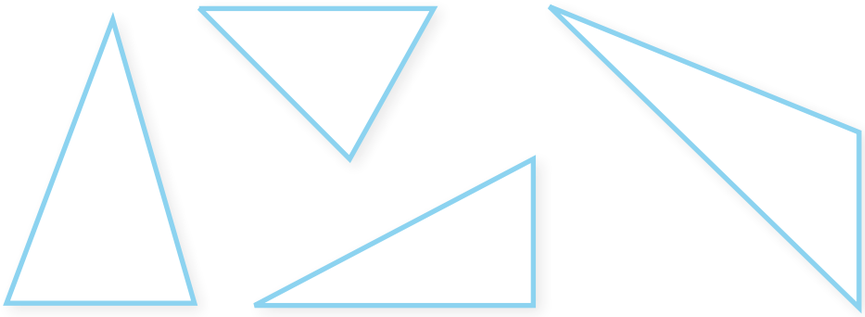


Figure 74 Shapes with three sides

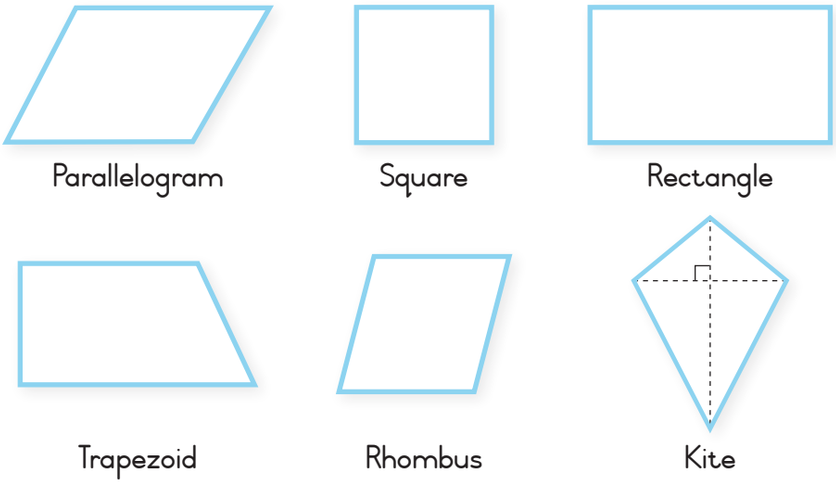


Figure 75 Shapes with four sides

Swivumbeko swa matlhelo mambirhi (2-D)

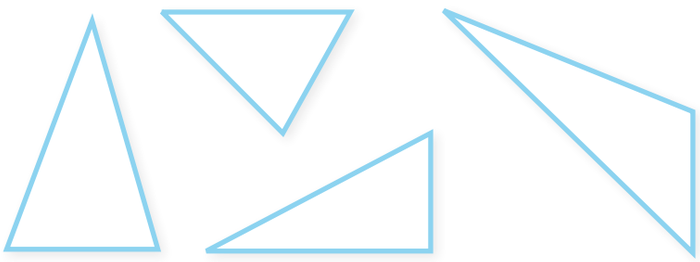
Eka Giredi ya V, vadyondzi va lemuka, va kuma na ku nyika mavito ya swivumbeko swa 2-D: swirhendzevutana, tinhlanharhu, swikwere na tinhlamune. Endzeni na le handle ka kamara ro dyondzela va vona swivumbeko naswona va nga valanga swihlawulekisi swa swivumbeko leswi nga eswifanisweni na ku lava michumu leyi 'langutekaka ku fana na' swivumbeko, xik. mfungho wa le gondzweni wu nga ha languteka ku fana na xirhendzevutana, nghilazi ya fasitere ku fana na xikwere, rivanti ri fana na yinhlamune.

Eka maendlelo ...

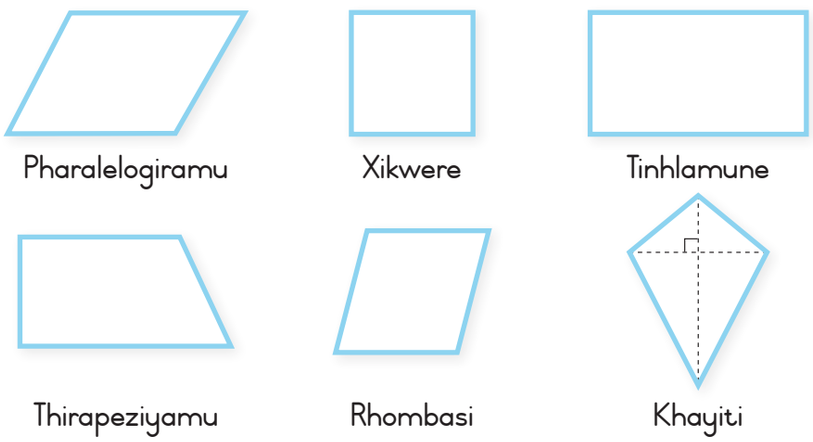
Vadyondzi va nga:

- Valanga swihlawulekisi swa swivumbeko swa 2-D leswi nga endzeni na le handle ka kamara ro dyondzela, swo tanihi swirhendzevutana, swikwere, tinhlamune na tinhlanharhu.
- Lava michumu leyi yi nga na xivumbeko xa 'xikwere', va ri karhi va kongomisa eka tlhelo kumbe xikandza xa bokisi kumbe xivumbeko xa 'xirhendzevutana' va ri karhi va kongomisa eka mfungho wa le gondzweni kumbe tshaku kumbe makumu ya khapi.
- Hlamusela swivumbeko swa 2-D swa tisayizi to hambanahambana na miletelo leyi nga eswifanisweni.

Vadyondzi va fanele ku vona swivumbeko swa 2-D swo hambanahambana, xik. tinhlanharhu to hambanahambana (ku nga ri ntsena leti nga na matlhelo ya vulehi byo ringana), tinhlamune ta tisayizi to hambanahambana. Leswi swi ta pfuna vadyondzi ku vona leswaku hi swihi swivumbeko swo karhi leswi nga na swilo swo fana, tanihi xikombiso, leswaku tinhlanharhu hinkwato ti na matlhelo manharhu na tikhona tinharhu kambe ti nga ka ti nga languteki ti fana kwatsa, na leswaku tinhlamune ti na matlhelo ya mune swi nga ri na mhaka na vonakelo ra tona.



Xifaniso xa 74 Swivumbeko leswi nga na matlhelo manharhu



Xifaniso xa 75 Swivumbeko swa matlhelo ya mune

Give learners opportunities to explore 2-D shapes during independent play activities. Make a variety of materials available – plastic shapes (attribute blocks) and cardboard shapes of different colours and sizes – and then encourage learners to use them to create patterns, pictures and simple representations. During these activities, teachers can discuss with learners what they are doing and ask encouraging questions such as: 'Tell me about the pattern you are making.' 'That is a lovely house, how did you make it? Describe the steps to your partner.'

When Grade R learners begin to investigate and describe shapes and objects, they often use everyday language, such as flat, smooth, pointy. Gradually teachers can help them learn to focus on the lines of a shape or object and use maths terms to replace the everyday ones – sides, curved, straight, corner.

Learners' understanding of the properties of shapes develops as they are able to recognise **differences** and **similarities** between shapes. This can be done through sorting and classifying activities as well as through matching activities, such as deciding whether a shape will fit in a jigsaw or a construction, or playing shape lotto.

Figure 76 Differences and similarities of shapes

In practice ...

Go from 3-D to 2-D

Trace around learners and other objects in the classroom to see and talk about the 'picture' that is formed. Learners can dip objects in paint and press them on paper to make prints. They can also trace around the edge of objects and talk about the line and shape they create. Bowls, building blocks, toilet roll inners, and almost any recycled materials can be used to create shape pictures in this way.

Shape games

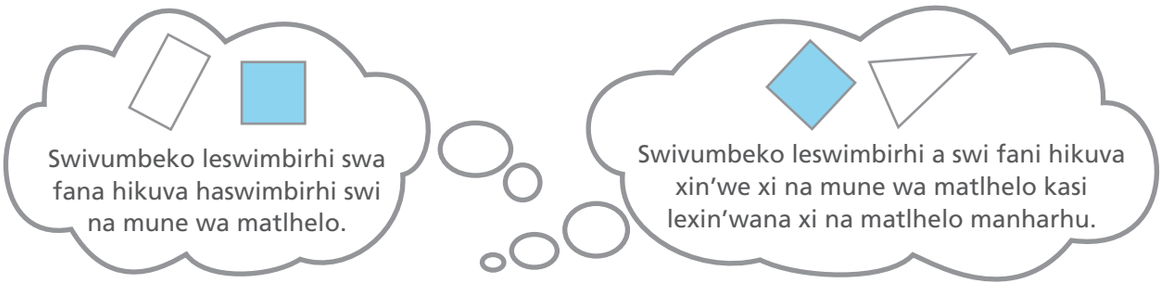
Learners play in pairs. One learner hides a shape or object behind her/his back and the other learner asks questions about it until she/he can guess what it is. 'Is it flat? Does it have three sides?'

Teachers can challenge learners to make as many different shapes as possible on a geoboard.

Nyika vadyondzi mikarhi ya ku valanga swivumbeko swa 2-D hi nkarhi wa migingiriko ya ku tlanga va ri voxe. Endla leswaku timatheriyali to hambanahambana ti kumeka – swivumbeko swa pulasitiki (tibuloko ta swihlawulekisi) na swivumbeko swa khadibodo swa mihlovo na tisayizi to hambanahambana – kutani endzhaku ka swona u khutaza vadyondzi ku swi tirhisa ku tumbuluxa tipatironi, swifaniso na vuyimeri byo olova. Hi nkarhi wa migingiriko leyi, vadyondzisi va nga kanela na vadyondzi leswi va nga eku swi endleni na ku vutisa swivutiso swo khutaza swo tanihi: 'Ndzi byele hi mayelana na patironi leyi u nga eku yi endleni.' 'Leyi i yindlu yo saseka, xana u yi endle njhani? Hlamusela nakuloni wa wena magoza ya wena.'

Loko vadyondzi va Giredi ya V va sungula ku lavisisa na ku hlamusela swivumbeko na michumu, hakanyingi va tirhisa ririmi ra masiku hinkwawo ro tanihi patlama, rhetela, tontswa. Hi katsongotsongo vadyondzisi va nga va pfuna ku dyondza ku kongomisa miehleketo eka mitila ya xivumbeko kumbe nchumu na ku tirhisa matheme ya metse ku siva lama ya masiku hinkwawo – matlhelo, gombonyoka, thwixama, khona.

Ntwisiso wa vadyondzi wa swihlawulekisi swa swivumbeko wa ndlandlamuka tanihiloko va ri karhi va kota ku lemuka **ku hambana** na **ku fanana** exikarhi ka swivumbeko. Leswi swi nga endliwa hi ku tirhisa migingiriko yo ava na yo ntlawahata xikan'we na hi ku tirhisa migingiriko yo pananisa yo tanihi ku boha loko xivumbeko xi ta ringana eka xiphazamiso kumbe eka ximakiwa, kumbe ku tlanga loto ya swivumbeko.



Xifaniso xa 76 Ku hambana na ku fana ka swivumbeko

Eka maendlelo ...

Famba kusuka eka 3-D kufika eka 2-D

Landzelerisa ku rhendzeleka na vadyondzi na michumu yin'wana leyi nga ekamareni ro dyondzela ku vona na ku vulavula hi mayelana na 'xifaniso' lexi xi vumbekeke. Vadyondzi va nga peta michumu leyi endzeni ka pende kutani va yi tshikelela ehenhla ka phepha ku endla migandlozo. Va nga tlhela va landzelerisa ku rhendzeleka na makumu ya michumu na ku vulavula hi mayelana na ntila na xivumbeko leswi va swi tumbuluxaka. Swikambana, tibuloko to aka, switsondzelelo swa phepha ra le xihambukelweni, na timatheriyali leti vuyelerisiweke tihi kumbe tihi leti nga tirhisiwaka ku vumba swifaniso swa swivumbeko hi ndlela leyi.

Mitlangu ya swivumbeko

Vadyondzi va tlanga hi vambirhimbirhi. Mudyondzi un'we u tumbeta xivumbeko kumbe nchumu endzhaku ka nhlana wa yena kutani mudyondzi lowuwun'wana a vutisa swivutiso hi mayelana na wona kufikela loko a kota ku vhumba leswaku i yini. 'Xana wu patlamile? Xana wu na matlhelo manharhu?'

Vadyondzisi va nga tlhontlha vadyondzi ku endla swivumbeko swo hambanahambana swo tala tanihilaha swi kotekaka hakona ehenhla ka jiyobodo.

Build and take apart shapes

Once learners can identify 2-D shapes (square, circle, triangle, rectangle) and 3-D objects (boxes and balls), they are ready to build and then take apart shapes:

- Straws, sticks and other similar materials can be used with playdough to make shapes.
- Ask learners to make a shape and discuss it. 'That's a square. Can you turn it into a triangle?'

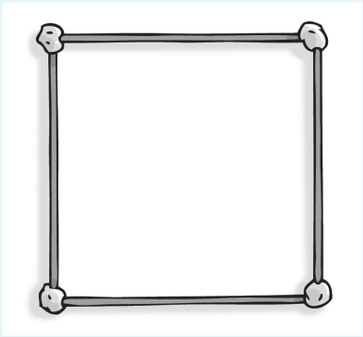


Figure 77 Building shapes

Construct shape pictures

Learners can use attribute blocks to create a picture.

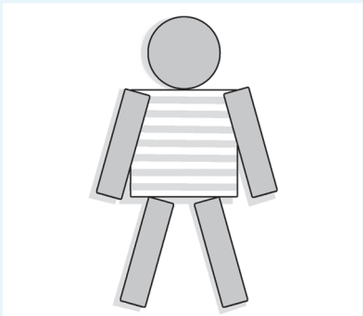


Figure 78 A shape picture

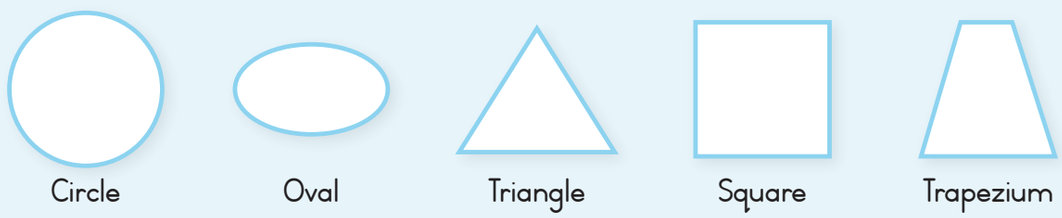
They can glue cut-out shapes onto paper to form other shapes or pictures.

They can roll, pinch and press playdough to make shapes and combine these to make new shapes.

Transformations

Learners slide, flip and turn shapes as they solve problems involving shapes, such as matching shapes in pictures, and copying shape patterns using attribute blocks.

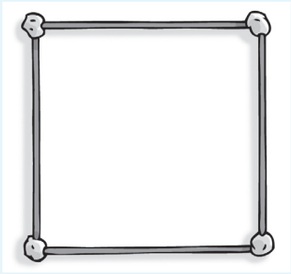
In higher grades learners will learn about a range of 2-D shapes. Learners in Grade R will often ask teachers and adults what a shape is called and the diagrams below provide a reference for these instances.



Aka na ku hambanisa swivumbeko

Xikan'wekan'we loko vadyondzi va kota ku kuma swivumbeko swa 2-D (xikwere, xirhendzevutana, yinhlanharhu, yinhlamune) na michumu ya 3-D (mabokisi na tibolo), va lunghekile ku aka na ku hambanisa swivumbeko:

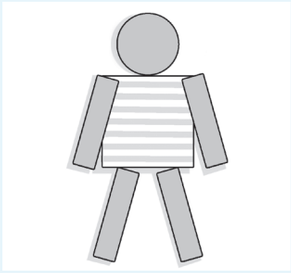
- Switirowu, tinhi na timatheriyali tin'wana swi nga tirhisiwa na vumba ro tlangisa ku endla swivumbeko.
- Kombela vadyondzi ku endla xivumbeko kutani va kanela hi xona. 'Xexo i xikwere. Xana u nga xi hundzula xi va yinhlanharhu?'



Xifaniso xa 77 Ku aka swivumbeko

Maka swifaniso swa swivumbeko

Vadyondzi va nga tirhisa tibuloko leti nga na swihlawulekisi ku tumbuluxa xifaniso.



Xifaniso xa 78 Xifaniso xa xivumbeko

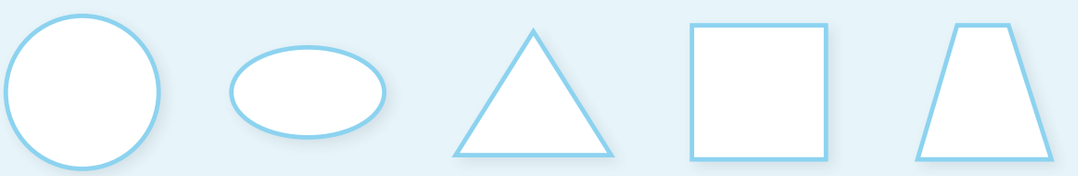
Va nga namarheta swivumbeko leswi tsemiweke ehenhla ka phepha ku vumba swivumbeko kumbe swifaniso swin'wana.

Va nga khunguluxa, va pfuva na ku tshikelela vumba ro tlangisa ku endla swivumbeko na ku swi katsanisa ku endla swivumbeko swintshwa.

Mihundzuluxo

Vadyondzi va rhetisa, va pfula na ku hundzuluxa swivumbeko loko va ri karhi va ololoxa swiphiqo leswi khumbaka swivumbeko, swo tanihi ku pananisa swivumbeko eka swifaniso, na ku kopunula tipatironi ta swivumbeko hi ku tirhisa tibuloko ta swihlawulekisi.

Eka tigiredi ta le henhla vadyondzi va ta dyondza hi mayelana na swivumbeko swa 2-D swo hambanahambana. Vadyondzi lava nga eka Giredi ya V hakanyingi va ta vutisa vadyondzisi na vatswatsi leswaku xana xivumbeko lexi xi vitaniwa yini naswona tidayagiramu leti nga laha hansi ti nyika xiyelaniso eka swiyimo leswi.



Xirhendzevutana Ovhali Yinhlanharhu Xikwere Thirapeziyamu

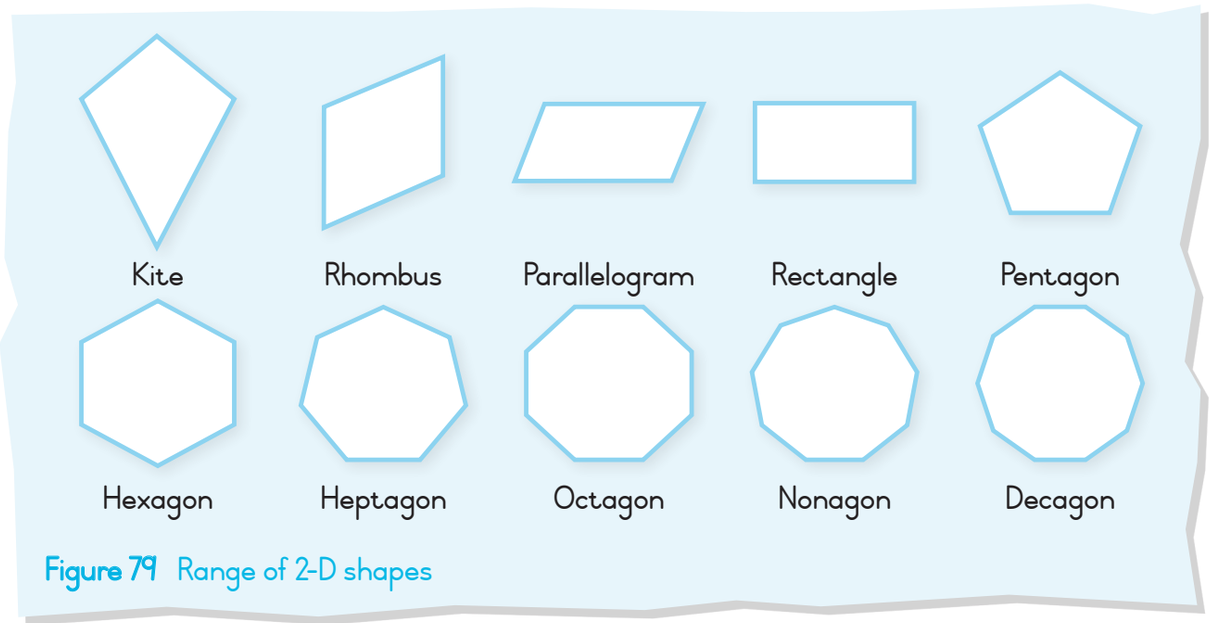


Figure 79 Range of 2-D shapes

Symmetry

Learners can notice symmetrical patterns all around them, in nature, in buildings, in paintings and objects. In the early years, **symmetry** is easiest understood as 'reflection' or 'mirroring'. Learners can explore this concept by folding and cutting shapes and pictures in half, or by drawing a picture on one half of a piece of paper using wax crayons, then folding the paper and rubbing the area behind their drawing and seeing the exact copy of what they have drawn reproduced on the other half of the page.

GLOSSARY

symmetry
when a shape or object can be divided into two equal halves along a central line

Symmetrical patterns can be found on our bodies, in nature, in the built environment and in pictures. Line symmetry divides the shape into two identical parts. The line can be horizontal or vertical.

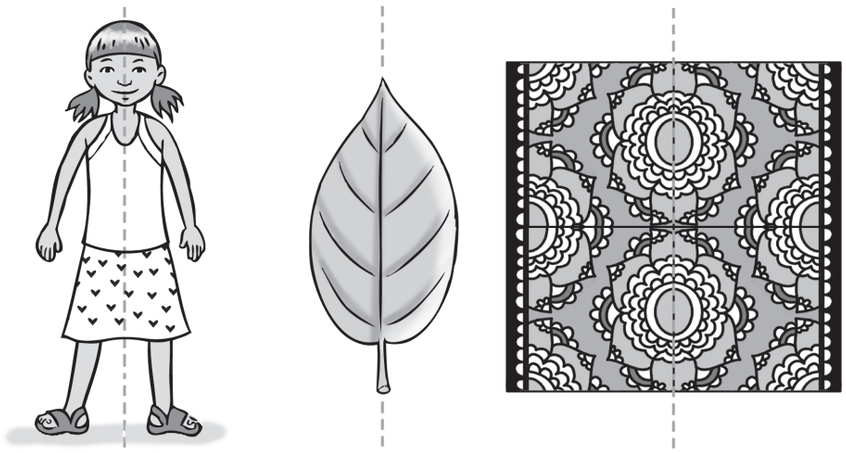
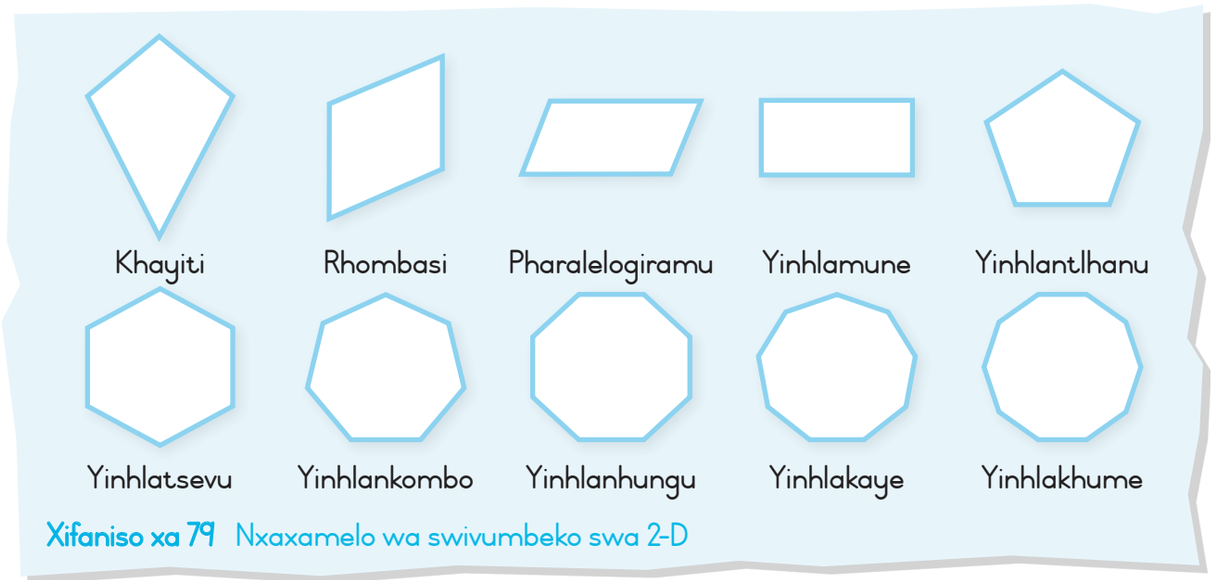


Figure 80 Line symmetry divides the shape into two identical parts.

In Grade R, learners explore symmetry by comparing objects and pictures. They learn that symmetry is not about being 'the same as', but rather about being identical, for example, a butterfly is symmetrical, but a hand is not.



Xifaniso xa 79 Nxaxamelo wa swivumbeko swa 2-D

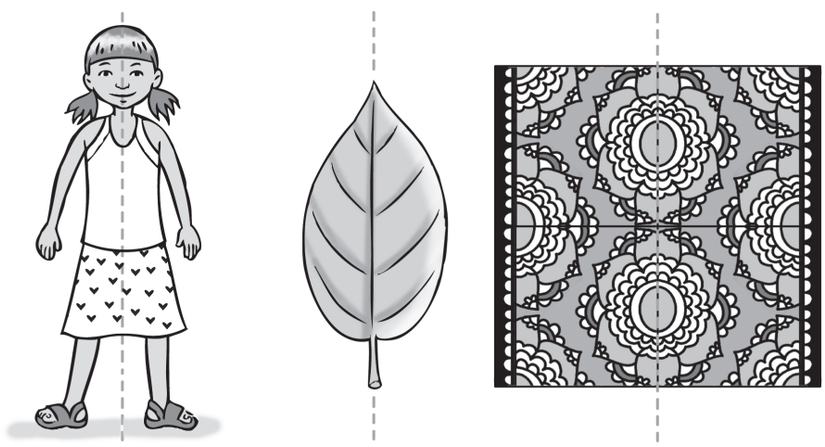
Ndzinganiso

Vadyondzi va nga kota ku vona tipatironi ta ndzinganiso leti nga ekusuhi na vona, eka miako, eka swifaniso swo pendiwa na le ka michumu. Emalembeni ya le kusunguleni, **ndzinganiso** a wu twisisiwa hi ku olova tanihi 'nkambisiso' kumbe 'vuvonisi'. Vadyondzi va nga kota ku valanga nongoti lowu hi ku petsa na ku tsema swivumbeko na swifaniso hi hafu, kumbe hi ku dirowa xifaniso eka hafu yin'we ya xiphemu xa phepha hi ku tirhisa tikhirayoni ta mhula, endzhaku ka swona va petsa phepha leri va chukuchela ndhawu leyi nga endzhaku ka xidirowiwa xa vona kutani va vona kopi leyi fanaka kwatsa na ya leswi va swi diroweke swi humelele eka hafu leyin'wana ya pheji.

DLILOSARI

ndzinganiso
loko xivumbeko kumbe nchumu wu kota ku avanyisiwa hi tihafu timbirhi to ringana hi leka ntila wa le xikarhi

Tipatironi ta ndzinganiso ti nga kumeka emirini ya hina, eka ntumbuluko, eka mbangu wo aka na le swifanisweni. Ntila wa ndzinganiso wu avanyisa xivumbeko hi swiphemu swimbirhi swo fana. Ntila lowu wu nga hingakanya kumbe wu thwixamela ehenhla.



Xifaniso xa 80 Ntila wa ndzinganiso wu avanyisa xivumbeko hi swiphemu swimbirhi swo fana.

Eka Giredi ya V, vadyondzi va valanga ndzinganiso hi ku fananisa michumu na swifaniso. Va dyondza leswaku ndzinganiso a wu hi mayelana na ku 'fana na' kambe hi mayelana na ku fana, tanihi xikombiso, phaphatana ra ringanana, kambe xandla a xi ringanani.

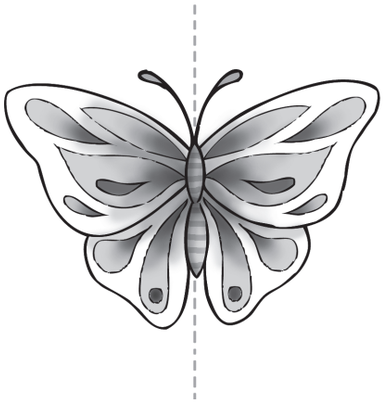


Figure 81 Symmetrical

Figure 82 Not symmetrical

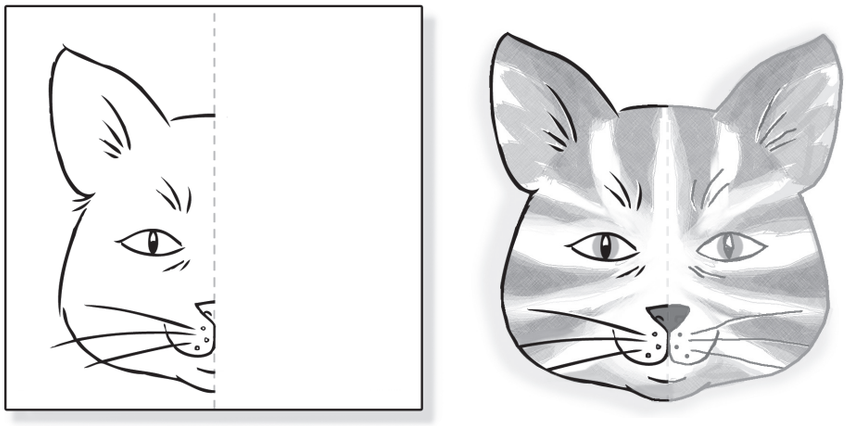
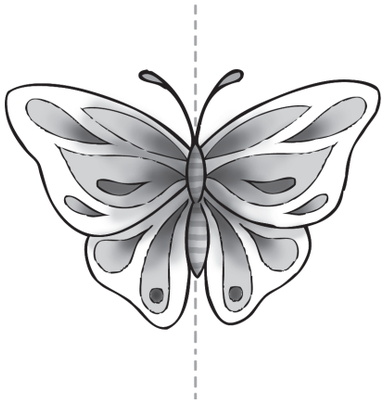


Figure 83 Folded piece of paper with image cut out and copied opposite to show symmetry.

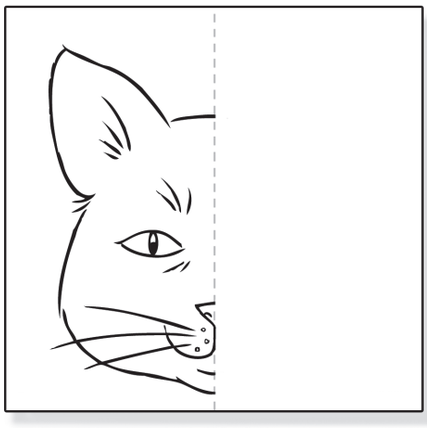
Questions to ask for Space and Shape (Geometry)

- Where are you standing?
- What is in front of/behind you?
- Can you tell me how to get from … to …?
- Can you show me how to move around the box, over the chair and under the table?
- What shape is this?
- How do you know it is a triangle/square/rectangle/circle?
- How many sides does this shape have?
- How many corners/points does this shape have?
- What can you tell me about the sides of this shape?
- What can you tell me about the line?
- What is the same/different about these two shapes?
- Why do they belong together?



Xifaniso xa 81 Swo ringanana

Xifaniso xa 82 A swi ringanani



Xifaniso xa 83 Xiphemu xa phepha leri petsiweke leri nga na xifaniso lexi tsemiweke ri tlhela ri kopunuriwa etlhelo lerin'wana ku komba ndzinganiso.

Swivutiso leswi faneleke ku vutisiwa eka Ndhawu na Xivumbeko (Jometiri)

- Xana u yime kwihi?
- Xana i yini lexi xi nga emahlweni ka wena/endzhaku ka wena?
- Xana u nga ndzi byela hilaha u nga endlaka hakona kusuka eka … kufika eka …?
- Xana u nga ndzi komba hilaha ku fambiwaka hakona ku rhendzeleka hi bokisi, hi le henhla ka xitulu na hi le hansi ka tafula?
- Xana i xivumbeko muni lexi?
- Xana u swi tiva njhani leswaku i yinhlanharhu/xikwere/yinhlamune/xirhendzevutana?
- Xana xivumbeko lexi xi na matlhelo mangani?
- Xana xivumbeko lexi xi na tikhona/vutontswi byingani?
- Xana u nga ndzi byela yini hi mayelana na matlhelo ya xivumbeko lexi?
- Xana u nga ndzi byela yini hi mayelana na ntila lowu?
- Xana hi kwihi ku fana/ku hambana hi mayelana na swivumbeko leswimbirhi?
- Hikwalahokayini swi wela endhawini yin'we?

- Can you see anything in the classroom that looks like this shape?
- What would happen if I flipped this shape? What would happen if I turned this shape around?
- Can you use these shapes to make a model of that picture?
- Which of these objects can roll/slide?
- Can you put these objects on top of each other?
- Can these shapes fit together?
- Can you find an object with flat sides?
- Can you find an object with curved sides?
- How many edges/corners/points does the box have?
- What is the same/different about these two boxes?

Vocabulary for Space and Shape (Geometry)

Position and direction

- in, on, off, on top of, over, under, out, into, out of, top, bottom, above, below, between, in front of, behind, next to, upside down
- near, far, beside, side, inside, outside
- close, closer
- far, further
- near
- straight, turn
- around, along, through
- to, from, towards, away from
- opposite
- forward, backwards, sideways
- left, right

2-D shapes

- circle, square, rectangle, triangle
- line, side, edge, corner, point, sharp
- curved, straight

3-D objects

- block, box, bottom, top, sides, flat
- lines, straight, edge
- corner, sharp, point
- ball, round, curved

Symmetry

- same as
- left, right
- top, bottom

- Xana u nga kota ku vona xilo xihi kumbe xihi lexi nga ekamareni leri ro dyondzela lexi xi langutekaka ku fana na xivumbeko lexi?
- Xana ku ta humelela yini loko ndzo hundzuluxa xivumbeko lexi? Xana ku ta humelela yini loko ndzo hundzuluxa xivumbeko lexi kutani endzhaku ku va emahlweini?
- Xana u nga tirhisa swivumbeko leswi ku endla xikombiso xa xifaniso xexo?
- Xana hi wihi wa michumu leyi wu nga khungulukaka/rhetaka?
- Xana u nga kota ku tlhandleka michumu leyi ehenhla ka yona vini?
- Xana swivumbeko leswi swi nga kota ku nghenelana?
- Xana u nga kota ku kuma nchumu lowu nga na matlhelo yo patlama?
- Xana u nga kota ku kuma nchumu lowu nga na matlhelo yo gombonyoka?
- Xana bokisi leri ri na makumu/tikhona tingani/vutontswi byingani?
- Xana hi kwihi ku fana/ku hambana hi mayelana na mabokisi lamambirhi?

Ntivomarito wa Ndhawu na Xivumbeko (Jometiri)

Xiyimo na tlhelo

- endzeni, eka, ehandle, ehenhla ka, ehenhla, ehansi ka, ehandle ka, endzeni ka, exikarhi ka, emahlweni ka, endzhaku ka, ekusuhi na, yima hi nhloko
- ekusuhi, ekule, etlhelo ka, tlhelo, endzeni, ehandle
- kusuhi, kusuhinyana
- kule, kulenyana
- kusuhi
- thwixama, jika
- ku rhendzeleka, ku xaxamela, hi le xikarhi
- kuya, kusuka, kuya eka, ekule na
- ku fularhela
- emahlweni, endzhaku, ematlhelo
- ximatsi, xinene

Swivumbeko swa 2-D

- xirhendzevutana, xikwere, yinhlamune, yinhlanharhu
- ntila, tlhelo, makumu, khona, vutontswi, ntontswo
- gombonyoka, thwixama

Michumu ya 3-D

- buloko, bokisi, hansi, henhla, matlhelo, patlama
- mitila, thwixama, makumu
- khona, ntontswo, vutontswi
- bolo, xirhendzevutana, gombonyoka

Ndzinganiso

- fana na
- ximatsi, xinene
- henhla, hansi

Measurement

Children are involved in **measurement** when they play and explore in their everyday lives. They come to Grade R with their own ideas of measurement, for example, that an adult is 'big', that something is too high to reach, that they need many things to fill a box, that it takes a long time to walk to the shop. They will compare which of two sweets is the biggest, which is the tallest block tower or which of two boxes is the heaviest. Conceptual understanding of different kinds of measures develops gradually and grows out of children's practical, day-to-day experiences and conversations with adults and friends, when, for example, they might take the biggest piece of bread or compare height or find out who has the smallest foot or who has made the tallest tower. They make decisions about which of two toy cars will fit into a garage and how many blocks they would need to make the garage bigger or smaller. They may measure out ingredients for cooking, pouring water or sand from a jug to see how many cups can be filled, or compare how heavy a bag of sugar and a box of oranges is.

GLOSSARY

measurement
'how much' of something, e.g. height, length, mass, volume, capacity

Measurements and the units we use to measure are about finding 'how much' there is of a particular thing. Measurement links with other maths areas, such as numbers, patterns, shape and data. Learners count how many units are needed to measure physical quantities, such as height, capacity, volume, length, weight, or non-physical quantities, such as time, money or temperature. They may estimate which of something is 'more' or 'less', for example, the scoops of ice cream in a bowl. They will base their estimation on the amount of space the ice cream takes up, not on the weight of the bowls or the number of scoops.

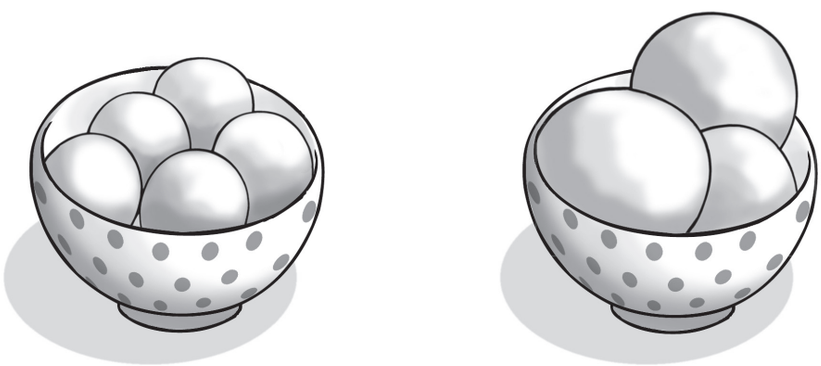


Figure 84 Estimating the amount of ice cream

In Grade R, measurement is practical and learners should do many hands-on activities that are meaningful to them. To understand measurement concepts, for example, how 'heavy' something is, learners need to pick up objects and compare their weight. Measurement is about determining the size or amount of one thing by comparing it with a non-standard unit, such as hands, feet, a pencil or a piece of string, or a standard unit of measurement, such as a centimetre or litre.

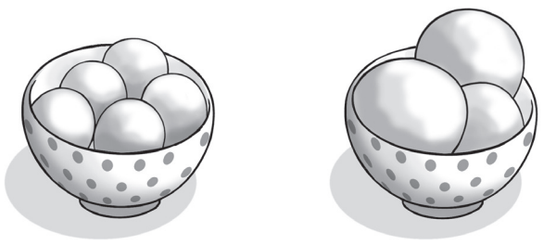
Mpimo

Vana va khumbeka eka **mpimo** loko va tlanga na ku valanga evutom'wini bya vona bya masiku hinkwawo. Va ta eka Giredi ya V va ri na mianakanyo ya vona ya mpimo, tanihi xikombiso, leswaku ntswatsi i 'nkulu', leswaku xin'wana xi le henhla kutlula mpimo ku xi fikelela, leswaku va lava swilo swo tala ku tatisa bokisi, leswaku swi teka nkarhi wo leha ku famba hi milenge kufika evhengeleni. Va ta fananisa leswaku hi xihi xa swiwitsi leswimbirhi xi nga xikulu, hi xihi xihondzo xa buloko xo leha kutlula hinkwaswo kumbe hi rihi ra mabokisi lamambirhi ri tikaka ngopfu. Ku twisisiwa ka xinongoti ka mixaka yo hambanahambana ya mipimo swi ndlandlamuka hi katsongotsongo naswona swi kula kusuka eka mitokoto ya vana yo endla, ya siku na siku, na mivulavurisano na vatswatsi na vanghana, tanihi xikombiso, loko va nga ha teka xiphemu lexikulu eka hinkwaswo xa xinkwa kumbe va fananisa vulehelahenhla kumbe va kumisisa leswaku i mani a nga na nkondzo lowutsongo eka hinkwayo kumbe i mani a endleke xihondzo xo leha kutlula hinkwaswo. Va teka swiboho hi mayelana na leswaku hi wihi wa mimovha yimbirhi yo tlangisa yi nga ta ringana egaraji na leswaku i tibuloko tingani va nga ta ti lava ku endla garaji yi va yikulunyana kumbe yitsongonyana. Va nga ha pima swichelachelana swa ku sweka, ku chela mati kumbe misava hi jeke ku vona leswaku i tikhapi tingani ti nga ta tatiwa, kumbe va fananisa leswaku bege ya chukela na bokisi ra malamula swi tika kufika kwihi.

DLILOSARI

mpimo
'i ntsengo wo tanihikwihi' wa swa swin'wana, xik. vulehelahenhla, vulehi, ntiko, vholumu, vundzeni

Mipimo na tiyuniti leti hi ti tirhisaka ku pima swi mayelana na ku kuma leswaku i 'i ntsengo wo tanihi kwihi' wu nga kona swa xin'wana. Mpimo wu xakelana na swiyenge swa metse swin'wana, swo tanihi tinomboro, tipatironi, xivumbeko na vuxokoxoko bya tinhlayo. Vadyondzi va hlayela leswaku i tiyuniti tingani ti lavekakaka ku pima mitalo yo khomeka, yo tanihi vulehelahenhla, vundzeni, vholomu, vulehi, ntiko, kumbe mitalo leyi nga khomekiki, yo tanihi nkarhi, mali kumbe mahiselo. Va nga ha kumbetela leswaku hi xihi xa swin'wana xi nga 'tala' kumbe xi nga 'ntsongo', tanihi xikombiso, swikupu swa ayisikhirimi leyi nga exikambanini. Va ta simeka nkumbetelo wa vona eka vukulu bya ndhawu lebyi ayisikhirimi yi byi tekaka, ku nga ri eka ntiko wa swikambana kumbe nhlayo ya swikupu.



Xifaniso xa 84 Ku kumbetela ntalo wa ayisikhirimi

Eka Giredi ya V, mpimo hi lowu endlekaka naswona vadyondzi va fanele ku endla migingiriko yo endla leyi nga na nkoka eka vona. Ku twisisa minongoti ya mpimo, tanihi xikombiso, leswaku xin'wana xi 'tika' kufika kwihi, vadyondzi va fanele ku tlakula michumu kutani va fananisa ntiko wa yona. Mpimo wu hi mayelana na ku kuma sayizi kumbe ntalo wa xilo xin'wana hi ku wu fananisa na yuniti leyi nga riki ya ntolovelo, yo tanihi swandla, mikondzo, penisele kumbe xiphemu xa ngoti, kumbe yuniti ya ntolovelo ya mpimo, yo tanihi sentimitara kumbe litara.

Teachers need to observe learners during the activities and talk with them about their ideas. Teachers can introduce new vocabulary while learners are comparing, for example, how long things are. When learners talk about something being 'big' or 'small' the teacher can model the use of the correct vocabulary by rephrasing their words. For example, when a learner says that someone is big or small teachers should encourage them to say what it is about the person that makes them big or small. Is it the height or the width or the weight of the person?

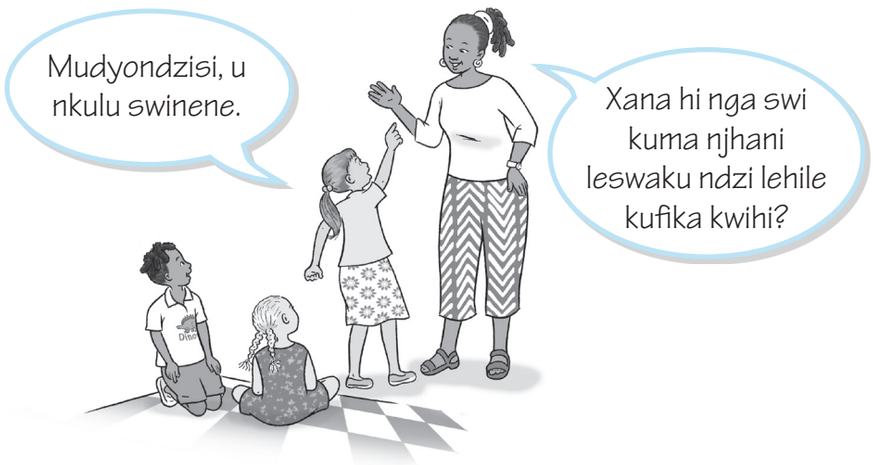
Figure 85 Using maths vocabulary

Once learners have decided what they want to measure (the attribute) they need to decide how they will measure a particular attribute, such as height.

Figure 86 Using hands to measure height

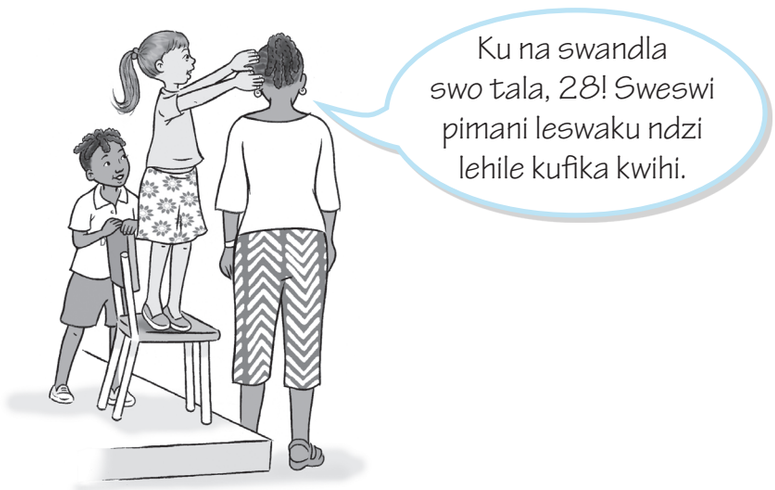
In this way, learners will begin to understand 'big' things aren't just large objects, and that they can look at them in terms of their length, height or weight.

Vadyondzisi va fanele ku xiyaxiya vadyondzi hi nkarhi wa migingiriko kutani va vulavula na vona hi mayelana na mianakanyo ya vona. Vadyondzisi va nga tivisa ntivomarito lowuntshwa loko vadyondzi va ri karhi va fananisa, tanihi xikombiso, leswaku swilo swi lehile kufika kwihi. Loko vadyondzi va vulavula hi mayelana na ku va xin'wana xi ri 'xikulu' kumbe xi ri 'xitsongo', mudyondzisi a nga kongomisa ntirho wa ntivomarito lowu nga lulama hi ku tirhisa marito ya vona eswivulweni hi vuntshwa. Tanihi xikombiso, loko mudyondzi a vula leswaku munhu un'wana u nkulu kumbe u ntsongo vadyondzisi va fanele ku va hlohlotela ku vula leswaku i yini hi munhu loyi xi n'wi endlaka a va lonkulu kumbe lontsongo. Xana i vulehelahenhla kumbe vuanami kumbe ntiko wa munhu loyi?



Xifaniso xa 85 Ku tirhisa ntivoririmi wa metse

Xikan'wekan'we loko vadyondzi va bohile leswi va lavaka ku swi pima (xihlawulekisi) va fanele ku boha hilaha va nga ta pima hakona xihlawulekisi xo karhi, xo tanihi vulehelahenhla.



Xifaniso xa 86 Ku tirhisa swandla ku pima vulehelahenhla

Hi ndlela leyi, vadyondzi va ta sungula ku twisisa leswaku swilo 'swikulu' a swo va tsena michumu leyikulu, na leswaku va nga kota ku swi languta hi ku ya hi vulehi bya swona, vulehelahenhla kumbe ntiko.

In practice ...

Learners also add or subtract when they solve measurement problems that involve number, for example, when they:

- compare amounts when pouring water or sand into different containers, they will realise they need 2 cups to fill a jug
- work out how many objects to place on either side of a balance scale to make the sides balance, they will realise that they need one more or fewer and count the total number
- construct block towers and add, subtract and count the number of blocks to make a tower taller or shorter.

Developing the concept of measurement

Learners should have plenty of opportunities to solve problems involving measurement and should have a range of appropriate containers that they can use in informal activities to investigate and find solutions for themselves. Learners need hands-on activities that involve comparisons by picking up, pouring, touching and talking about what they experience.

Figure 87 Containers for measurement activities

Different ways of measuring

Direct comparison

The focus of measurement is on comparing the attribute of something 'directly'. For example, measuring the length of a pencil against another pencil or comparing the height of two learners standing back to back.

Eka maendlelo ...

Vadyondzi va tlhela va hlanganisa kumbe va susa loko va tirha swiphiqo swo pima leswi swi khumbaka nhlayo, tanihi xikombiso, loko va:

- fananisa mitalo loko va chela mati kumbe misava eka tikhontheni to hambanahambana, va ta vona leswaku va lava tikhapi ti2 ku tata jeke
- tirha leswaku i michumu yingani leyi faneleke ku vekeriwa eka tlhelo rin'wana na rin'wana leswaku xikalo xi va na ndzingano, va ta vona leswaku va lava yin'wana yitsongo kumbe yingariyingani kutani va hlayela nhlayo hinkwayo
- maka swihondzo swa tibuloko na ku hlanganisa, ku susa na ku hlayela nhlayo ya tibuloko ku endla xihondzo xi lehanyana kumbe xi komanyana.

Ku hluvukisa nongoti wa mpimo

Vadyondzi va fanele va kuma mikarhi yo tala ya ku ololoxa swiphiqo leswi khumbaka mpimo naswona va fanele va va na tikhontheni to tala to hambanahambana leti faneleke leti va nga ta kota ku ti tirhisa eka migingiriko ya nkamafundza ku lavisisa na ku kuma switshunxo swa vona vini. Vadyondzi va rhandza migingiriko yo endla leyi khumbaka mifananiso hi ku tlakula, ku chela, ku khumba na ku vulavula hi mayelana na leswi va swi vonaka.

Xifaniso xa 87 Tikhontheni ta migingiriko yo pima

Tindlela to hambanahambana to pima

Mfananiso wo kongoma

Nkongomo wa mpimo wu le ka ku pima xihlawulekisi xa xin'wana 'hi ku kongoma'. Tanihi xikombiso, ku pimanisa vulehi bya pensele na pensele yin'wana kumbe ku fananisa vulehelahenhla bya vadyondzi vambirhi lava nga yima va fularhelana.

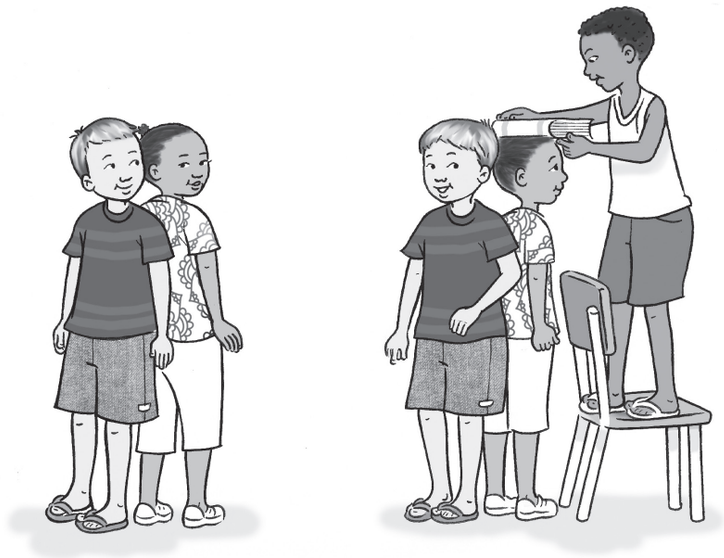


Figure 88 Comparing the height of two learners

'Max is taller than Lola.'
'How much taller is he?'

Comparisons can also involve ordering:
'Max is taller than Lola, but shorter than Elton.'

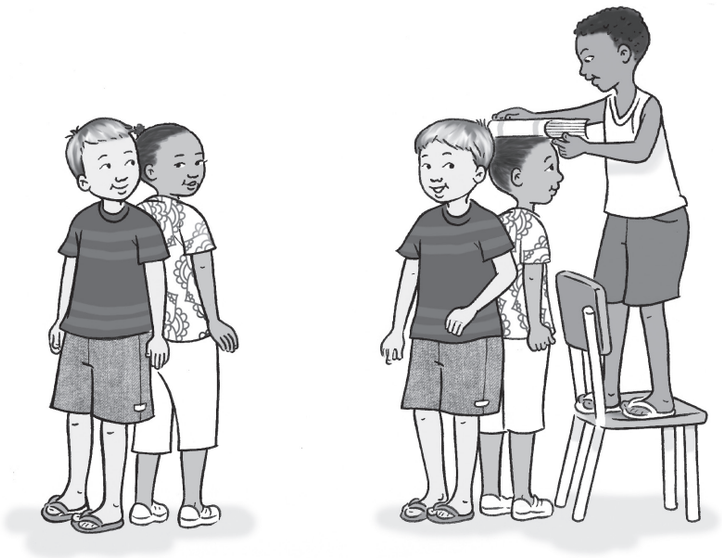
Figure 89 Tallest to shortest

Informal measuring

We measure informally, using **non-standard units** to measure, for example, when we use an arm's length to measure a piece of string, or use our feet to measure the size of a carpet.

GLOSSARY

non-standard unit
a unit of measurement that uses an object, such as a shoe, paper clip or cube; it can also be an informal item, such as a hand span, foot or body length



Xifaniso xa 88 Ku fananisa vulehelahenhla bya vadyondzi vambirhi

‘Max u lehile kutlula Lola.’
‘Xana u lehile kufika kwihi?’

Mifananiso yi nga tlhela yi khumba nxaxamelo:
‘Max u lehile kutlula Lola, kambe u komile kutlula Elton.’

Xifaniso xa 89 Ku leha kutlula ku ya eka ku koma kutlula

Ku pima ka nkamafundza

Hi pima hi ndlela ya nkamafundza, loko hi pima hi tirhisa **tiyuniti leti nga riki ta ntolovelo**, tanihi xikombiso, loko hi tirhisa vulehi bya voko ku pima xiphemu xa ngoti, kumbe hi tirhisa mikondzo ya hina ku pima sayizi ya mete.

DLILOSARI

yuniti leyi nga riki ya ntolovelo
yuniti ya mpimo leyi yi tirhisaka nchumu wo tanihi ntangu, ximanyisamaphepha kumbe khiyubu; yi nga tlhela yi va nchumu wa nkamafundza wo tanihi vunavi bya xandla, nkondzo kumbe vulehi bya miri

Standard measuring unit

We use standard units, such as millilitres, litres, centimetres, metres, grams, kilograms, minutes and hours to compare the length of something, how heavy something is or how long it takes to do something. We use standard units to measure more accurately.

Estimation

Learners need to develop estimation skills during their informal measurement activities, for example, they should estimate how heavy they think something is before measuring, or how long they think something is based on the number of blocks they think they will need to measure it, or how long they think it will take to finish tidying up the classroom. They then use measuring instruments to find out how accurate their estimation was.

In practice ...

Learners begin to understand what measurement means and why we need to measure. They understand that:

- Measurement involves direct comparison and the use of non-standard units, such as hands and feet, and other units that are exactly the same size or length, such as blocks, string, counting straws.
- Each unit is a different size; they realise that each measure produces a different result.
- We use one standard unit to measure so that we all have the same outcome when comparing an attribute.

Learners need plenty of opportunities to make decisions themselves about what to measure and how to measure. They should compare the results of their measurements and use different units to measure the same objects.

In higher grades, when learners have acquired comparison and estimation skills, they begin to use standard units. Some Grade R learners may be exposed to measuring tools at home and these can be discussed informally at school, for example:

- measuring jugs, measuring spoons – to measure millilitres, litres
- rulers, tape measures – to measure centimetres, metres
- scales – to measure grams, kilograms
- watches and clocks – to measure minutes, hours.

Yuniti yo pima ya ntolovelo

Hi tirhisa tiyuniti ta ntolovelo to tanihi timililitara, tilitara, tisentimitara, timitara, tigiramu, tikhilogiramu, timinete na tiawara ku fananisa vulehi bya xin'wana, xinwana xi tika kufika kwihi kumbe swi teka nkarhi wo tanihi kwihi ku endla xin'wana. Hi tirhisa tiyuniti ta ntolovelo ku pima hi nkhaqato swinene.

Nkumbetelo

Vadyondzi va fanele ku hluvukisa swikili swa nkumbetelo hi nkarhi wa migingiriko yo pima ya nkamafundza, tanihi xikombiso, va fanele ku kumbetela leswaku xin'wana xi tika kufika kwihi va nga si xi pima, kumbe va ehleketa leswaku xin'wana xi lehile kufika kwihi hi ku ya hi nhlayo ya tibuloko leti va ehleketaka leswaku va ta ti lava ku xi pima, kumbe va ehleketa leswaku swi ta teka nkarhi wo leha kufika kwihi ku basisa kamara ro dyondzela. Endzhaku ka swona va tirhisa switirho swo pima ku kumisisa hilaha nkumbetelo wa vona a wu ri wa nkhaqato hakona.

Eka maendlelo ...

Vadyondzi va sungula ku twisisa leswi mpimo swi vulaka swona na leswaku hikwalahokayini hi fanela ku pima. Va twisisa leswaku:

- Mpimo wu khumba mfananiso wo kongoma na ntirhiso wa tiyuniti leti nga riki ta ntolovelo, to tanihi swandla na mikondzo, na tiyuniti tin'wana leti ti nga ta sayizi kumbe vulehi byo fana kwatsa byo tanihi tibuloko, ngoti, switirowu swo hlayela.
- Yuniti yin'wana na yin'wana i sayizi yo hambana; va tiva leswaku mpimo wun'wana na wun'wana wu humesa mbuyelo wo hambana.
- Hi tirhisa yuniti yin'we ya ntolovelo ku pima ku endlela leswaku hinkwerhu hi ta kuma mbuyelo wo fana loko ku fananisiwa na xihlawulekisi.

Vadyondzi va fanele va kuma mikarhi yo tala ya ku ololoxa swiphiqo leswi khumbaka mpimo naswona va fanele va va na tikhontheni to tala to hambanahambana leti faneleke leti va nga ta kota ku ti tirhisa eka migingiriko ya nkamafundza ku lavisisa na ku kuma switshunxo swa vona vini. Va fanele ku fananisa mivuyelo ya mipimo ya vona kutani va tirhisa tiyuniti to hambanahambana ku pima michumu yo fana.

Eka tigiredi ta le henhla, loko vadyondzi va kumile swikili swa mfananiso na swa nkumbetelo, va sungula ku tirhisa tiyuniti ta ntolovelo. Vadyondzi van'wana va Giredi ya V va nga ha tivisiwa switirho swo pima ekaya naswona leswi swi nga ha kaneriwa hi ndlela ya nkamafundza exikolweni, tanihi xikombiso:

- tijeke to pima, swilepulana swo pima – ku pima timililitara, tilitara
- tirhula, tithepi to pima – ku pima tisentimitara, timitara
- swikalo – ku pima tigiramu, tikhilogiramu
- tiwachi na swikombankarhi – ku pima timinete, tiawara.

Time

The practical aspects of measurement – distance, capacity, weight – can be presented to learners through familiar activities and events, but time is a difficult abstract concept for learners to understand. This is partly because adults do not always use the language of time accurately, and use everyday expressions like, 'I will be there in a minute,' but then take much longer than that. Also, young children tend to live 'in the moment' and therefore recalling past events in order or predicting future events is more difficult for them. Learners need to understand how time passes in their own lives, so teachers need to relate time to the learners' daily experiences and events that are familiar to them.

- Sequencing events: Learners need to understand the language of time so that they can talk about the order in which a sequence of events occurs. Use the daily routine and stories to talk about the order of events during the day and the sequence of actions to complete a task – 'what happened next/before/after'.
- Units of time: Compare different units of time: school time is in the morning, home time is in the afternoon, bedtime is at night, two 'sleeps' until your birthday. Make a weather chart, keep a monthly calendar and record important events on a pictorial timetable. Talk about 'yesterday, today, tomorrow'. Gradually learners begin to understand how time builds into days of the week, months of the year and seasons.
- Rates of speed: Run and race outside. Use plastic guttering to make tracks to roll marbles along and ramps to push cars up and down. Dance to slow and fast music. Ask learners how long it takes them to brush their teeth or walk around the school. Talk about fast, quick and slow movements and activities.

Length

In Grade R, the focus is on estimating, measuring, comparing and ordering length and distance. Learners need to understand that in order to find out the length of something they need to measure it from one end to the other end. For example, they can measure and compare the length of a pencil using paper clips as non-standard units. The illustration below shows how the same pencil can be measured using two different units of measurement. In the first picture there are five paper clips and in the second picture there are three larger paper clips.

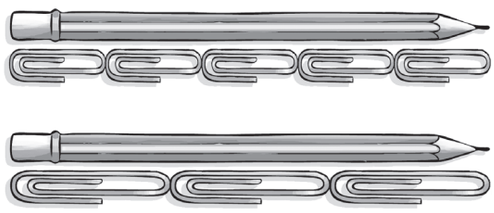


Figure 90 Measuring length with two different units of measurement

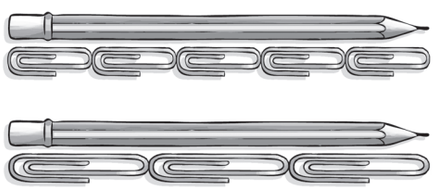
Nkarhi

Swiphemu swa ntolovelo swa mpimo – mpfhuka, vundzeni, ntikelo – swi nga andlariwa eka vadyondzi hi ku tirhisa migingiriko na swiendleko, kambe nkarhi i nongoti wo anakanyiwa wo tika eka vadyondzi ku wu twisisa. Hi tlhelo leswi swi tano hikuva vatswatsi a hi mikarhi hinkwayo va tirhisaka ririmi ra nkarhi hi nkhaqato, naswona va tirhisa swiga swo fana na, 'Ndzi ta va ndzi fikile hi minete,' kambe endzhaku ka swona va teka nkarhi wo hundza kwalaho. Nakambe, vana lavatsongo va tala ku hanya 'eka xinkandyana' kutani hikokwalaho va tsundzuka swiendleko swa nkarhi lowu nga hundza hi ku landzelelana kumbe ku kumbetela swiendleko swa vumundzuku swi va tikela swinene. Vadyondzi va fanele ku twisisa hilaha nkarhi wu hundzaka hakona evuton'wini bya vona vini hikokwalaho vadyondzi va fanele ku fambelanisa nkarhi eka mitokoto na swiendleko swa siku na siku swa vadyondzi leswi swi nga toloveleka eka vona.

- Longoloxa swiendleko: Vadyondzi va fanele ku twisisa ririmi ra nkarhi ku endlela leswaku va kota ku vulavula hi mayelana na nandzelelano lowu swilo swi nga humelela hi wona. Tirhisa migingiriko ya siku na siku na switori ku vulavula hi mayelana na nandzelelano wa swiendleko esikwini na malongolokelo ya swiendlo ku hetisa ntirho – 'xana ku humelele yini leswi nga landzela/emahlweni ka swona/endzhaku ka swona'.
- Tiyuniti ta nkarhi: Fananisa tiyuniti ta nkarhi to hambanahambana: nkarhi wa xikolo i wa nimixo, nkarhi wa le kaya i wa ndzhenga, nkarhi wo etlela i wa nivusiku, 'etlela' kambirhi ku nga si fika siku ra wena ra ku velekiwa. Endla chati ya ta maxelo, va na na khalendara ya n'hweti na n'hweti kutani u rhekoda swiendleko swa nkoka eka xikombamikarhi xa swifaniso. Vulavula hi mayelana na 'tolo, namuntlha, mundzuku'. Hi katsongotsongo vadyondzi va sungula ku twisisa hilaha nkarhi wu akaka wu va masiku ya vhiki, tin'hweti ta lembe na tinguva.
- Mipimo ya rivilo: Tsutsumani na ku siyana ehandle. Tirhisani tigatara ta pulasitiki ku endla swiporo swo khunguluxela timavula ku xaxamela na swona na ku endla swiganga swa ku gonyisa na ku ehlisa mimovha. Cinelani vuyimbeleri byo nonoka na byo hatlisa. Vutisa vadyondzi leswaku swi va tekela nkarhi wo leha kufika kwihi ku chukucha meno ya vona kumbe ku rhendzeleka na xikolo. Vulavulani hi mayelana na mifambafambo na migingiriko yo hatlisa swinene, yo hatlisa na yo nonoka.

Vulehi

Eka Giredi ya V, nkongomo wu le ka ku kumbetela, ku pima, ku fananisa na ku xaxameta vulehi na mpfhuka. Vadyondzi va fanele ku twisisa leswaku ku kumisisa vulehi bya xin'wana va fanele ku pima kusuka eka makumu man'we kufika eka man'wana. Tanihi xikombiso, va nga pima na ku fananisa vulehi bya pensele hi ku tirhisa swimanyisamaphepha tanihi tiyuniti leti nga riki ta ntolovelo. Nkombiso lowu nga laha hansi wu komba hilaha pensele yin'we yi nga pimiwaka hakona hi ku tirhisa tiyuniti to hambanahambana to pima. Eka xifaniso lexo sungula ku na ntlhanu wa swimanyisamaphepha naswona eka xifaniso xa vumbirhi ku na swimanyisamaphepha leswikulu swinharhu.



Xifaniso xa 90 Ku pima vulehi hi tiyuniti timbirhi to pima to hambana

Learners can also measure from top to bottom to find the length of something, for example, to find out how tall the learners in the class are. Then you can arrange them in order from the tallest to the shortest.

- Direct comparison: Find things that are longer than/shorter than … Sort objects according to length and height. Talk about and describe why the objects are sorted in a particular way.
- Attributes: Talk about the length, height or width that is to be measured.
- Non-standard units: Use hands, leaves, pencils to measure and compare objects.
- Uniform non-standard units: Use the same size unit, for example, blocks. Place these along the whole length of the object being measured. Later use one block and move it along, counting the number of moves.

Mass

In Grade R the focus is on estimating, weighing, comparing and ordering objects according to how heavy or light they are. It takes time for learners to understand the concept that size and mass (or weight) are different. Learners need to explore small heavy objects, small light objects, big heavy objects and big light objects and make comparisons between them. Teachers should help learners focus on how heavy the object is, not on its size.

- Direct comparison: Hold an object and estimate its **mass**. Find things that are heavier or lighter than the object.
- Attributes: Talk about the shape, size and mass of the object being measured.
- Non-standard units: Use a balance scale to compare the mass of objects. Place an object to be weighed on one side of the scale. Add another (or more than one) object on the other side of the scale to make it level.
- Uniform non-standard units: Use the same size unit, for example, a large block or a book to compare the mass of objects using the balance scale.

GLOSSARY

mass
how heavy something is

Capacity

The **capacity** of an object is how much it can hold, for example, a one-litre milk bottle can hold one litre of liquid. In Grade R, the focus is on estimating, measuring, comparing and ordering containers according to how much they can hold. Teachers need to provide many opportunities for learners to use the concepts of empty and full, for example, when they are filling or emptying containers with water or sand and during snack time. Learners can fill containers with different substances and talk about their capacity: 'How many cups of water do we need to fill this jug? Why do we need fewer milk bottles of water to fill the jug?'

GLOSSARY

capacity
the maximum or greatest amount that something (such as a bucket or a box, or a stadium) can hold

Vadyondzi va nga tlhela va pima kusuka ehenhla kufika ehansi ku kuma vulehi bya xin'wana, xik. ku kumisisa hilaha vadyondzi lava nga etlilasini va leheke hakona. Endzhaku ka swona u nga va veketela hi ku landzelelana kusuka eka lowo leha kutlula hinkwavo kufika eka lowo koma kutlula hinkwavo.

- Mfananiso wo kongoma: Kuma swilo leswi swi nga leha kutlula/koma kutlula … Ava michumu ku ya hi vulehi na vulehelahenhla. Vulavulani hi mayelana na hikwalahokayini na ku hlamusela leswaku hikwalahokayini michumu yi aviwa hi ndlela yo karhi.
- Swihlawulekisi: Vulavula hi mayelana na vulehi, vulehelahenhla kumbe vuanami lebyi byi faneleke ku pimiwa.
- Tiyuniti leti nga riki ta ntolovelo: Tirhisa swandla, matluka, tipensele ku pima na ku fananisa michumu.
- Tiyuniti leti nga riki ta ntolovelo to fana: Tirhisa yuniti ya sayizi yo fana, tanihi xikombiso, tibuloko. Veka leswi swi xaxamela na vulehi hinkwabyo bya nchumu lowu nga eku pimiweni. Endzhaku ka swona tirhisa buloko yin'we kutani u yi fambisa yi xaxamela, u ri karhi u hlayela nhlayo ya mifambo.

Ntiko

Eka Giredi ya V, nkongomo wu le ka ku kumbetela, ku kala, ku fananisa na ku xaxameta michumu hi ku ya hi ku wu tika kumbe wu vevuka kufika kwihi. Swi teka nkarhi wo tanihi kwihi eka vadyondzi ku twisisa nongoti wa leswaku sayizi na ntiko (kumbe ntikelo) swi hambanile. Vadyondzi va fanele ku valanga michumu leyitsongo yo tika, michumu leyitsongo yo vevuka, michumu leyikulu yo tika na michumu leyikulu yo vevuka na ku endla mifananiso exikarhi ka yona. Vadyondzisi va fanele ku pfuna vadyndzi ku kongomisa eka leswaku nchumu lowu wu tika kufika kwihi, ku nga ri sayizi ya wona.

- Mfananiso wo kongoma: Khoma nchumu kutani u kumbetela **ntiko** wa wona. Kuma swilo leswi swi tikakanyana kumbe swi vevukakanyana kutlula nchumu lowu.
- Swihlawulekisi: Vulavulani hi mayelana na xivumbeko, sayizi, na ntiko wa nchumu lowu nga eku pimiweni.
- Tiyuniti leti nga riki ta ntolovelo: Tirhisa xikalo xo ringanisa ku fananisa ntiko wa michumu. Veka nchumu lowu wu faneleke ku pimiwa eka tlhelo rin'we ra xikalo. Engetela nchumu (kumbe kutlula wun'we) wun'wana eka tlhelo lerin'wana ra xikalo ku xi endla xi va eka levhele.
- Tiyuniti leti nga riki ta ntolovelo to fana: Tirhisa yuniti ya sayizi yo fana, tanihi xikombiso, buloko leyikulu kumbe buku leyikulu ku fananisa ntiko wa michumu hi ku tirhisa xikalo xo ringanisa.

DLILOSARI

ntiko
hilaha xin'wana xi tikaka hakona

Vundzeni

Vundzeni bya nchumu hi leswaku i swo tala kufika kwihi leswi wu nga swi khomaka, tanihi xikombiso, bodhlela ra masi ra litara yin'we ri nga khoma litara yin'we ya swihalaki. Eka Giredi ya V, nkongomo wu le ka ku kumbetela, ku pima, ku fananisa na ku xaxameta tikhontheni hi ku ya hi ku i swo tala kufika ti nga swi pangaka. Vadyondzisi va fanele ku nyika vadyondzi nkarhi wo tala ku tirhisa minongoti ya hava nchumu na tele, xik. loko va ri eku cheleni na le ku chululeni ka tikhontheni mati kumbe misava na hi nkarhi wa swinambunambu. Vadyondzi va nga chela tikhontheni michumu yo hambanahambana kutani va vulavula hi mayelana na vundzeni bya tona: 'Xana i tikhapi tingani ta mati hi ti lavaka ku tata jeke leyi? Hikwalahokayini hi lava mabodhlela ya masi mangarimangani ya mati ku tata jeke leyi?'

DLILOSARI

vundzeni
ntalo wa le henhlahenhla kumbe wa lowukulukumba lowu xin'wana (xo tanihi bakiti kumbe bokisi, kumbe rivala ra mitlangu) xi nga wu pangaka

- Direct comparison: Fill, empty and pour between similar containers using water or sand to find out if they hold the same amount. Initially, learners are likely to estimate that the taller of two containers will hold more water.
- Non-standard units: Experiment with how much water or sand different containers can hold. Compare which holds 'more' or 'less'. Fill one container and then pour the water or sand into another to see if it overflows or if there is room left for more to be added. Fill tall and wide containers and put them in order from the one that holds the most to the one that holds the least.
- Uniform non-standard units: Count the number of spoons or cups that fill containers of the same and different sizes.

Volume

Volume is about how much of something an object is holding, such as water, sand, rice or sugar. In Grade R, the focus of measuring should be on how much a container can hold (capacity) rather than the amount of space a container takes up (volume). Volume can change according to the amount of contents at any given time, but capacity is always the same, for example, the capacity of the jug is 1 litre regardless of how much it contains at the moment. This is a difficult concept for learners in Grade R to grasp.

GLOSSARY

volume
the amount something is holding or the space the contents take up

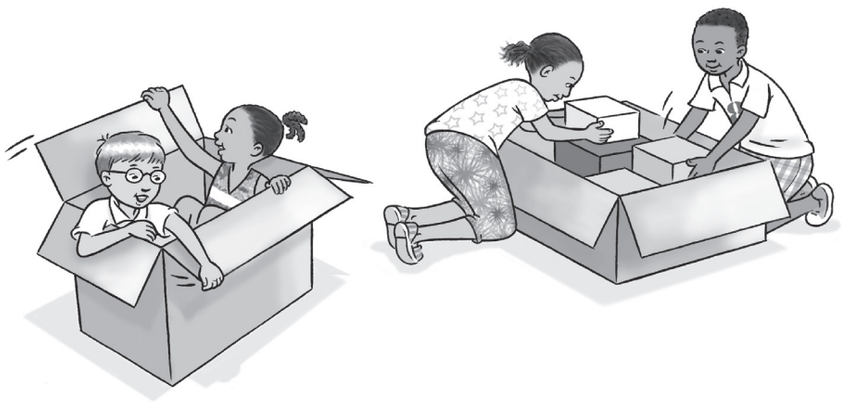


Figure 91 Exploring capacity and volume

- Direct comparison: Learners experiment with different-shaped containers to find out how big the container is and how much they think it could hold.
- Non-standard units: Float containers like plastic lunchboxes, plastic peanut butter jars, milk jugs in water. Fill them with counters or sand and discuss what happens. Ask questions such as: 'Do they still float? What happens to the water in the bucket? Does it spill over?'

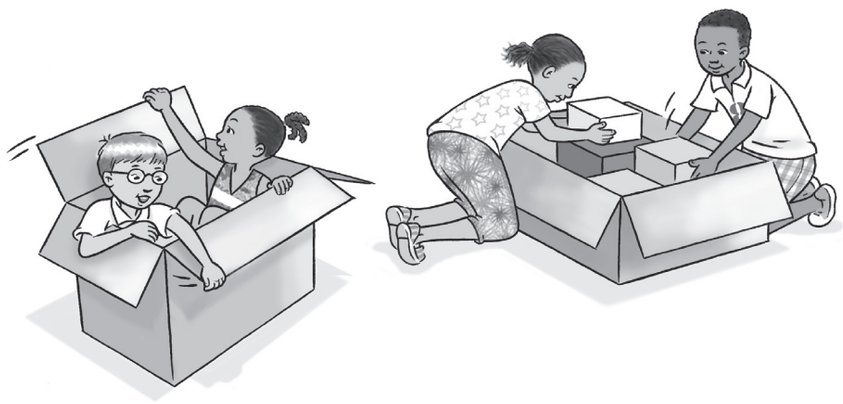
- Mfananiso wo kongoma: Tata, chulula na ku chela exikarhi ka tikhontheni to fana hi ku tirhisa mati kumbe misava ku kumisisa loko ti panga ntalo wo ringana. Emasungulweni, vadyondzi va tala ku kumbetela leswaku tikhontheni timbirhi leto lehanyana ti ta panga mati yo tala swinene.
- Tiyuniti leti nga riki ta ntolovelo: Kambisisa leswaku i mati kumbe misava yo tala kufika kwihi tikhontheni to hambanahambana ti nga yi pangaka. Fananisa leswaku hi yihi yi pangaka 'yo tala' kumbe 'yitsongo'. Tata khontheni yin'we kutani u chela mati kumbe misava eka leyin'wana ku vona loko yi khapa kumbe loko ku ri na ndhawu leyi salaka ya yin'wana ku va yi engeteriwa. Tata tikhontheni leto leha na leto anama kutani u ti veka hi ku longoloka kusuka eka leyi yi pangaka yo tala kutlula hinkwato kufika eka leyi pangaka yitsongo kutlula hinkwato.
- Tiyuniti leti nga riki ta ntolovelo to fana: Hlayela nhlayo ya malepula kumbe tikhapi leti ti tataka tikhontheni ta tisayizi to fana na to hambana.

Vholumu

Vholumu yi hi mayelana na leswaku i swo tala kufika kwihi nchumu wu nga swi khomaka, swo tanihi mati, misava, rhayisi kumbe chukela. Eka Giredi ya V, nkongomo wa ku pima wu fanele ku va eka leswaku i swo tala kufika kwihi khontheni yi nga swi khomaka (vundzeni) ematshan'weni ya ntalo wa ndhawu leyi khontheni yi wu tekaka (vholumu). Vholumu yi nga cinca nkarhi wihi kumbe wihi hi ku ya hi ntalo wa leswi nga endzeni, kambe vundzeni mikarhi hinkwayo bya fana, tanihi xikombiso, vundzeni bya jeke i litara yi1 swi nga ri na mhaka leswaku i swo tala kufika swihi yi nga na swona eka nkarhi wolowo. Lowu i nongoti wo tika ku wu twisisa eka vadyondzi lava nga eka Giredi ya V.

DLILOSARI

vholumu
ntalo lowu xin'wana xi nga wu khoma kumbe ndhawu leyi leswi nga endzeni swi yi tekaka



Xifaniso xa 91 Ku valanga vundzeni na vholumu

- Mfananiso wo kongoma: Vadyondzi va kambisisa hi tikhontheni ta swivumbeko swo hambanahambana ku kumisisa leswaku khontheni i yikulu kufika kwihi naswona va ehleketa leswaku i swo tala kufika kwihi yi nga swi khomaka.
- Tiyuniti leti nga riki ta ntolovelo: Tikhontheni to papamala ku fana na swikhafuthini swa pulasitiki, tijara ta pulasitiki ta botere ya timanga, tijeke ta masi leti nga na mati. Swi tati hi swo hlayela kumbe misava kutani mi kanela hi leswi swi humelelaka. Vutisa swivutiso swo tanihi leswi: 'Xana ta ha papamala? Xana ku humelela yini eka mati lama nga ebakitini? Xana ma khapa?'

Questions to ask for Measurement

- What did you do when you woke up?
- What did you do next?
- What happened after that?
- What did we do before …?
- What will we do after …?
- Which moves the fastest/slowest?
- What day is …? What day will be …?
- Which one is longer/shorter?
- Which one is heavier/lighter?
- How many cups/spoons/bottles does … hold?
- Which container can hold more than this container?
- Whose container has the most capacity? How do you know?
- I am really thirsty. Which cup should I use? Why?

Vocabulary for Measurement

- match, sort, compare, order
- measure, same as

Time

- before, after, next, now, then
- quickly, slowly
- day, night, morning, afternoon
- today, yesterday, tomorrow
- week, days of the week
- month, months of the year
- calendar
- year, date
- autumn, winter, spring, summer, seasons

Length

- how long, short, wide, tall
- taller, longer, shorter, wider
- shortest to longest, longest to shortest

Mass

- heavy, heavier, heaviest
- light, lighter, lightest

Capacity

- more, less, empty, full

Volume

- big, little, large, small, tiny

Swivutiso leswi faneleke ku vutisiwa eka Mpimo

- Xana hi swihi leswi u swi endleke loko u pfuka?
- Xana hi swihi leswi u swi endleke ku landzela swoleswo?
- Xana ku humelele yini endzhaku ka sweswo?
- Xana hi swihi leswi hi swi endleke emahlweni ka sweswo …?
- Xana hi swihi leswi hi nga ta swi endla endzhaku ka sweswo …?
- Xana hi swihi leswi swi hatlisaka kutlula hinkwaswo/nonoka kutlula hinkwaswo?
- Xana i ra vungani …? Xana ku ta va ra vungani …?
- Hi xihi xi nga lehanyana/komanyana?
- Hi xihi xo tikanyana/vevukanyana?
- Xana i tikhapi/malepula/mabodhlela mangani … xi ma khomaka?
- Xana i khontheni yihi yi nga khomaka kutlula khontheni leyi?
- Xana i khontheni ya mani yi nga na vundzeni byo tlula hinkwato? Xana u swi tiva njhani?
- Ndzi na torha hakunene. Xana i khapi yihi leyi ndzi faneleke ku yi tirhisa? Hikwalahokayini?

Ntivomarito wa Mpimo

- pananisa, ava, fananisa, xaxameta
- pima, fana na

Nkarhi

- emahlweni ka, endzhaku ka, landzelaka, sweswi, khale
- hi ku hatlisa, hi ku nonoka
- nhlekanhi, vusiku, mixo, ndzhenga
- namuntlha, tolo, mundzuku
- vhiki, masiku ya vhiki
- n'hweti, tin'hweti ta lembe
- khalendara
- lembe, siku
- xixikana, xixika, ximun'wana, ximumu, tinguva

Vulehi

- xana i xo leha, koma, anama, lehele ehenhla kufika kwihi
- lehele ehenhlanyana, lehanyana, komanyana, anamanyana
- xo koma kufika eka xo leha kutlula hinkwaswo, xo leha kufika eka xo koma kutlula hinkwaswo

Ntiko

- tika, tikanyana, tika kutlula hinkwaswo
- vevuka, vevukanyana, vevuka kutlula hinkwaswo

Vundzeni

- tala, ntsongo, hava nchumu, tele

Vholumu

- nkulu, ntsongo, nkulukumba, solekana

Data Handling

Young children ask questions as they try to make meaning of the world they live in. Teachers need to encourage learners in Grade R to ask questions and seek explanations. These questions can be used as the basis for collecting information (data) and finding out about things and events.

Sorting and classifying

Learners constantly sort and **classify** objects around them in different ways. They put objects into groups of different colours and sizes, they pack and unpack items at home and at school, sorting them into piles of different shapes and uses, for example:

- sorting and matching groups of objects: socks, shoes, plates, cups
- packing objects: cans, boxes, bottles, counters
- sorting counters or toys by attribute: colour, size, type
- tidy-up time: books, blocks, puzzles, games, crayons.

GLOSSARY

classify
the process of grouping similar things in a systematic way, e.g. separating clothes by winter and summer

Objects can be sorted and classified according to their similarities, such as colour. The more learners know about the properties of objects, such as plants and animals, and their similarities and differences, the more they are able to classify them into different groups.

Data Handling involves collecting, sorting and organising, representing and interpreting information in order to solve a problem or answer a question, for example, 'How many learners like eating apples?' In order to answer this question, learners would need to collect information, sort it and represent it in a way that would make it easy for them to interpret the information in order to answer the question.

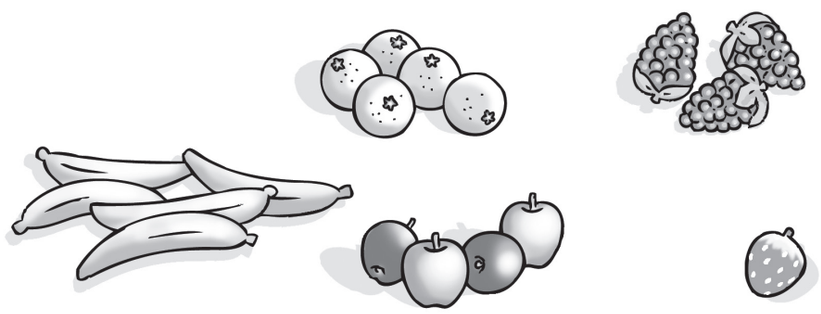


Figure 92 Collecting, sorting and organising into groups

Data Handling can link to other areas of learning, for example, finding out about:

- the world around us, by observing and recording the daily weather or collecting different kinds of leaves
- personal preferences, like favourite colours
- healthy foods, like fruit and vegetables.

Matirhiselo ya Vuxokoxoko bya Tinhlayo

Vana lavatsongo va vutisa swivutiso loko va ri karhi va ringeta ku kuma nhlamuselo ya vutomi lebyi va hanyaka eka byona. Vadyondzisi va fanela ku khutaza vadyondzi va ka Giredi ya V ku vutisa swivutiso na ku lava tinhlamuselo. Swivutiso leswi swi nga tirhisiwa tanihi masungulo ya ku hlengeleta vuxokoxoko (vuxokoxoko bya tinhlayo) na ku kumisisa hi mayelana na swilo na swiendleko.

Ku ava na ku ntlawahata

Vadyondzi hi mikarhi hinkwayo va ava na ku **ntlawahata** michumu leyi nga ekusuhi na vona hi tindlela to hambanahambana. Va veketela michumu hi mitlawa ya mihlovo na tisayizi to hambanahambana, va paka na ku hahlulela michumu ekaya na le xikolweni, va yi ava hi tinhulu ta swivumbeko na matirhiselo yo hambanahambana, tanihi xikombiso:

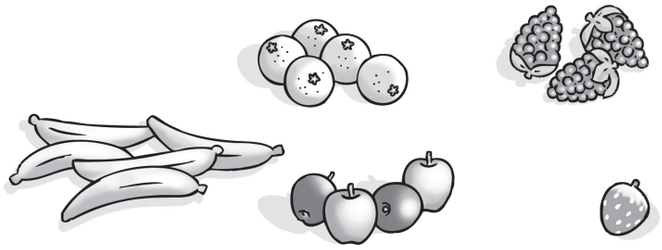
- ku ava na ku pananisa mitlawa ya michumu: masokisi, tintangu, tipuleti, tikhapu
- ku paka michumu: swikotela, mabokisi, mabodhlela, swo hlayela
- ku ava swo hlayela kumbe switlangiso hi xihlawulekisi: muhlovo, sayizi, muxaka
- hi nkarhi wo basisa: tibuku, tibuloko, swiphazamiso, mitlangu, tikhirayoni.

DLILOSARI

ntlawahata
endlelo ro ntlawahata michumu yo yelana hi ndlela ya xisisitematiki, xik. ku hambanisa swiambalo swa xixika na ximumu

Michumu yi nga aviwa na ku ntlawahatiwa hi ku ya hi ku fanana ka yona, swo tanihi muhlovo. Loko vadyondzi va ya emahlweni va tiva swinene hi mayelana na swihlawulekisi swa michumu yo tanihi swimila na swiharhi, na ku fanana na ku hambana ka swona, va ya emahlweni va kota ku tiva swinene ku swi ntlawahata hi mitlawa yo hambanahambana.

Matirhiselo ya Vuxokoxoko bya Tinhlayo ya khumba ku hlengeleta, ku ava na ku veketela, endla vuyimeri na ku humesa nhlamuselo ya vuxokoxoko hi xikongomelo xa ku ololoxa xiphiqo kumbe ku hlamula xivutiso, xik. 'Xana i vadyondzi vangani va tsakelaka ku dya maapula?' Hi xikongomelo xa ku hlamula xivutiso lexi, vadyondzi va fanele ku hlengeleta vuxokoxoko, va byi ava na ku endla vuyimeri bya byona hi ndlela leyi yi nga ta endla swi va olovela ku humesa nhlamuselo eka vuxokoxoko lebyi ku hlamula xivutiso lexi.



Xifaniso xa 92 Hlengeleta, ava na ku veketela hi mitlawa

Matirhiselo ya Vuxokoxoko bya Tinhlayo ma nga xakelana na swiyenge leswin'wana swa ku dyondza, tanihi xikombiso, ku kumisisa hi mayelana na:

- misava leyi hi nga eka yona, hi ku xiyaxiya na ku rhekoda maxelo ya siku na siku kumbe ku hlengeleta tinxaka to hambanahambana ta matluka
- mitsakelo ya munhu yena n'wini, kufana na mihlovo ya xirhandzwa
- swakudya swa rihanyo lerinene, kufana na mihandzu na matsavu.

Identifying attributes

Initially, learners sort and classify objects according to one attribute, such as colour, size or shape. Gradually they can give reasons for why they have grouped objects in a certain way. They can also think of other ways of grouping the same objects, based on a different attribute. As learners explore and talk about how they are gathering, organising and sorting 'things' around them, they begin to organise objects into groups based on more than one attribute, such as the colour and shape of objects.

In practice ...

A teacher could ask learners to sort a collection of different coloured shapes:

- Find all the green shapes.
- Find all the squares.
- Find the green squares.

Sorting by two attributes is challenging for learners because they have to understand conceptually the difference between the three groups. Two of the groups have only one attribute while the third group has attributes that make it fit into both groups.

The Data Handling cycle

People often refer to the process of Data Handling as a cycle because the events or activities that are involved are repeated in the same sequence for each new question that is answered.

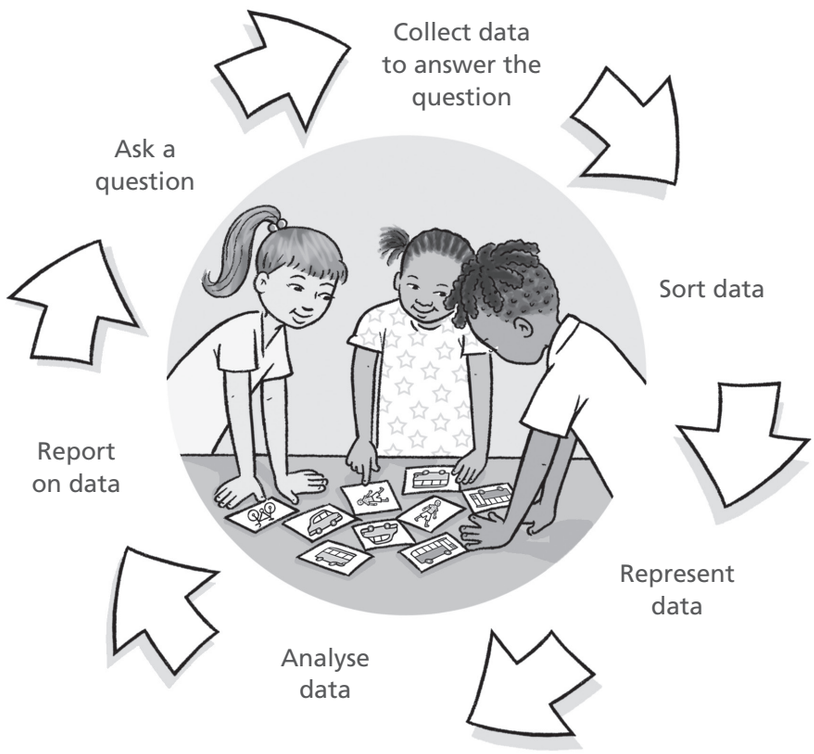


Figure 93 The Data Handling cycle

Ku kuma swihlawulekisi

Emasungulweni, vadyondzi va ava na ku ntlawahata michumu hi ku ya hi xihlawulekisi xin'we, xo tanihi muhlovo, sayizi kumbe xivumbeko. Hi katsongotsongo va nga nyika swivangelo swa leswaku hikwalahokayini va ntlawahata michumu hi ndlela yo karhi. Va nga tlhela va ehleketa hi tindlela tin'wana ta ku ntlawahata michumu yo fana, hi ku ya hi xihlawulekisi xo hambana. Loko vadyondzi va ri karhi va valanga na ku vulavula hi mayelana na hilaha va hlengeletaka, va veketelaka na ku ava 'swilo' leswi nga ekusuhi na vona, va sungula ku veketela michumu hi mitlawa hi ku ya hi kutlula xihlawulekisi xin'we, xo tanihi muhlovo na xivumbeko xa michumu.

Eka maendlelo ...

Mudyondzisi a nga kombela vadyondzi ku ava nhlengelo wa swivumbeko swo hambanahambana leswi hlovohatiweke:

- Kuma swivumbeko swa rihlaza hinkwaswo.
- Kuma swikwere hinkwaswo.
- Kuma swikwere swa rihlaza hinkwaswo.

Ku ava hi swihlawulekisi swimbirhi swi tlhontlha vadyondzi hikuva va fanele ku twisisa hi ndlela ya xinongoti ku hambana exikarhi ka mitlawa yinharhu. Mimbirhi ya mitlawa leyi wu na xihlawulekisi xin'we ntsena loko ntlawa wa vunharhu wu ri na swihlawulekisi leswi swi wu endlaka wu ringanela eka mitlawa hayimbirhi.

Ndzhendzeleko wa Matirhiselo ya Vuxokoxoko bya Tinhlayo

Hakanyingi vanhu va vula leswaku endlelo ra Matirhiselo ya Vuxokoxoko bya Tinhlayo i ndzhendzeleko hikuva swiendleko kumbe migingiriko leyi khumbekaka yi vuyeleriwa hi nongoloko wo fana eka xivutiso xin'wana na xinwana lexintshwa lexi xi hlamuriwaka.

Xifaniso xa 93 Ndzhendzeleko wa Matirhiselo ya Vuxokoxoko bya Tinhlayo

1. **Ask a question:** Learners decide what they want to find out about, e.g. 'I wonder how many learners come to school by bus and how many come by car?' The thread that holds data together is the reason for collecting specific data or information. This means that the data collected or groups generated through sorting should feed into answering a question that the learners have decided they want to find answers to.
2. **Collect data:** Learners decide how they want to collect data based on the question or problem, e.g. by asking other learners how they come to school and drawing a picture for each.
3. **Sort data:** Learners organise and sort the data into groups according to the attribute. In order to answer questions and decide how to represent data they have collected, decisions need to be made about how things could be sorted.
4. **Represent data:** Learners explore different ways of showing or displaying the information they have collected, e.g. by placing real objects on the mat or constructing **pictographs**.
5. **Analyse data:** Learners describe and compare the data that is represented, e.g. which is the most or least used form of getting to school.

GLOSSARY

pictograph
a way of representing data using pictures

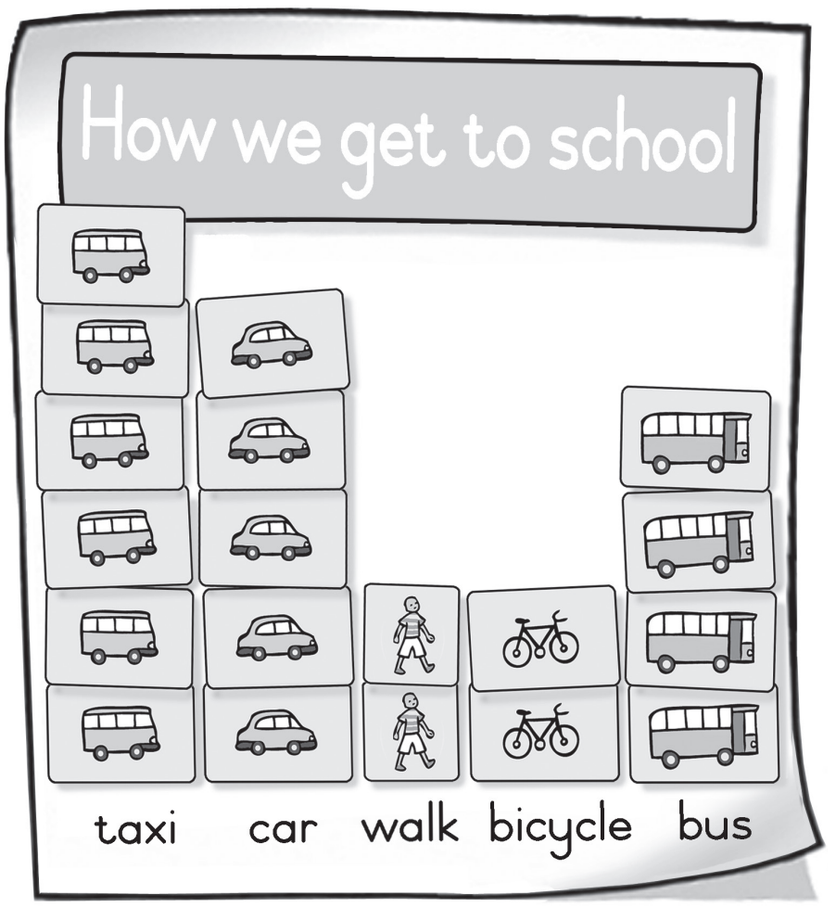


Figure 94 A pictograph

1. **Vutisa xivutiso:** Vadyondzi va boha lexi va lavaka ku xi kumisisa hi mayelana na, xik. ‘A ndzi tivi leswaku ku nga va ku ri vadyondzi vangani va taka exikolweni hi bazi naswona i vangani va taka hi movha?’ Ngoti leyi khomaka vuxokoxoko bya tinhlayo endhawini yin’we hi xona xivangelo xa ku hlengeleta vuxokoxoko bya tinhlayo byo karhi. Leswi swi vula leswaku vuxokoxoko bya tinhlayo lebyi hlengeletiweke kumbe mitlawa leyi vumbiweke hi ku ava yi fanele ku ku pfuna ku hlamula xivutiso lexi vadyondzi va boheke leswaku va lava ku kuma tinhlamulo ta xona.
2. **Hlengeleta vuxokoxoko bya tinhlayo:** Vadyondzi va boha hilaha va lavaka ku hlengeleta hakona vuxokoxoko bya tinhlayo hi ku ya hi xivutiso kumbe xiphiqo lexi, xik. hi ku vutisa vadyondzi lavan’wana hilaha va taka exikolweni hakona na ku dirowa xifaniso xa xin’wana na xinwana.
3. **Ava vuxokoxoko bya tinhlayo:** Vadyondzi va veketela na ku ava vuxokoxoko bya tinhlayo hi mitlawa hi ku ya hi xihlawulekisi lexi. Leswaku va hlamula swivutiso na ku boha hilaha ku faneleke ku endliwa hakona vuxokoxoko bya tinhlayo lebyi va byi hlengeleteke, swiboho swi fanele ku endliwa hi mayelana na hilaha swilo swi nga aviwaka hakona.
4. **Endla vuyimeri bya vuxokoxoko bya tinhlayo:** Vadyondzi va valanga tindlela to hambanahambana ta ku kombisa na ku humesela erivaleni vuxokoxoko lebyi va byi hlengeleteke, xik. hi ku veka michumu ya xiviri emeteni kumbe ku maka **tiphikitogirafu**.
5. **Xopaxopa vuxokoxoko bya tinhlayo:** Vadyondzi va hlamusela na ku ava vuxokoxoko bya tinhlayo lebyi tirhisiweke eka vuyimeri, xik. i muxaka wihi lowu tirhisiwaka swinene kumbe switsongo ku ta exikolweni.

DLILOSARI

phikitogirafu
ndlela ya ku endla vuyimeri bya vuxokoxoko bya tinhlayo hi ku tirhisa swifaniso

Xifaniso xa 94 Phikitogirafu

6. **Report on data:** Learners answer the question that was initially asked, 'I wonder how many learners come to school by bus and how many come by car?' They can easily see that four learners come to school by bus and five learners come to school by car. They can also compare other information, such as how many learners come to school in other ways and which mode of transport is used the most or least.

Questions to ask for Data Handling

- Which group has the most/least? Can you tell without counting?
- Which group has more/fewer?
- What do you think the answer will be?
- How should we find out?
- Why did you put these things together?
- Could you organise these another way?
- Do these belong here?
- Are oranges or bananas the most popular fruit?
- How many days were: sunny, windy, rainy, …?
- What would happen if …?

Vocabulary for Data Handling

- match, sort, compare
- same, different, belongs, does not belong
- more than, fewer than, same as
- always, sometimes, never
- row, column
- maybe, possible, sure

6. **Vika vuxokoxoko bya tinhlayo:** Vadyondzi va hlamula xivutiso lexi a xi vutisiwile ekusunguleni, ‘Swa ndzi hlamarisa xana ku nga va ku ri vadyondzi vangani va taka exikolweni hi bazi naswona i vangani va taka hi movha?’ Va ta kota ku vona hi ku olova leswaku tsevu wa vadyondzi va ta exikolweni hi bazi naswona ntlhanu wa vadyondzi va ta exikolweni hi movha. Va nga tlhela va fananisa vuxokoxoko byin‘wana byo tanihi ku i vadyondzi vangani va taka exikolweni hi tindlela tin‘wana naswona i muxaka wihi wa xifambo lowu wu tirhisiwaka swinene kumbe switsongo.

Swivutiso leswi faneleke ku vutisiwa eka Matirhiselo ya Vuxokoxoko bya Tinhlayo

- Xana i ntlawa wihi wu nga na swo tala/switsongo? Xana u nga swi vula u nga hlayelangi?
- Xana i ntlawa wihi wu nga na swo tala/swingariswingani?
- Xana u ehleketa leswaku nhlamulo ku ta va yini?
- Xana hi ta swi kumisisa njhani?
- Hikwalahokayini u veke swilo leswi swin‘we?
- Xana u nga swi veketela hi ndlela yin‘wana?
- Xana leswi swi wela laha?
- Xana i malamula kumbe tibanana ti rhandziwaka ngopfu?
- Xana i masiku mangani a ku ri na: mumu, moya, mpfula, …?
- Xana a ku ta humelela yini loko …?

Ntivomarito wa Matirhiselo ya Vuxokoxoko bya Tinhlayo

- pananisa, ava, fananisa
- fana, hambana, wela, a xi weli kona
- tele kutlula, ntsongo kutlula, fana na
- mikarhi hinkwayo, mikarhi yin‘wana, nga pfuki
- rixaxa, kholomu
- kumbexana, koteka, tiyisisa

Glossary

abstract an idea, a thought or a feeling

acoustic counting counting out loud, saying the numbers in the correct order (also known as oral or rote counting)

applications different ways of using maths concepts and skills, e.g. checking your change in a shop, counting out your taxi fare, or dividing a packet of peanuts between three friends

attribute a feature or characteristic of something, for example, colour or shape

capacity the maximum or greatest amount that something (such as a bucket or a box, or a stadium) can hold

classify the process of grouping similar things in a systematic way, e.g. separating clothes by winter and summer

comparing looking for similarities and differences between two or more objects, e.g. 'these are both animals, but one of them is blue and the other one is red'. Comparing is about finding the relationship between objects based on specific features. This skill leads to the ability to classify objects.

concept an idea or thought. In other words, it cannot be touched. Maths concepts include number, counting, space, addition and subtraction.

developmental progression order in which skills and concepts build on one another

diversity a range of people with a variety of differences of, for example, identity, personality, capabilities, interests and background

elements the objects, movements or events in a pattern

exact precise, accurate

formative assessment assessment that provides information while learning is taking place and measures learners' progress

geometry an aspect of mathematics that deals with properties, measurement and relationships of points, lines and angles of shapes in space

inclusivity the practice of ensuring that all children, regardless of their differences, are included in all classroom activities

interact communicate with other people; do activities with other people

mass how heavy something is

matching identifying the same attribute in two or more objects, e.g. all the yellow objects. Matching is an important skill for learning one-to-one correspondence.

measurement 'how much' of something, e.g. height, length, mass, volume, capacity

mediation a joint activity where a person who knows more or has more highly developed skills guides others to learn something new

non-standard unit a unit of measurement that uses an object, such as a shoe, paper clip or cube; it can also be an informal item, such as a hand span, foot or body length

Dlilosari

hambana nxaxamelo wa ku hambana ko hambanahambana, tanihi xikombiso, vutitivisi, vumunhu, vuswikoti, mitsakelo na mbangu

jometiri xiphemu xa matematiki lexi xi tirhanaka na swihlawulekisi, mipimo na vuxaka bya vutontswi, mitila na tinhla ta swivumbeko eka ndhawu

ku ava ku kuma swilo leswi swi fanaka, kumbe swi yelanaka, na ku swi ntlawahata hi swihlawulekisi swo kongoma. Rosungula ava hi xihlawulekisi xin'we, xo tanihi muhlovo, xik. 'swivumbeko swa rihlaza hinkwaswo'. Endzhaku ka swona ava hi swihlawulekisi swimbirhi swo tanihi muhlovo na sayizi, xik. 'swivumbeko swa rihlaza, leswitsongo hinkwaswo'.

ku fananisa ku lava leswi fanaka na leswi hambanaka exikarhi ka michumu mimbirhi kumbe kutlula, xik., 'leswi haswimbirhi i swiharhi kumbe xin'we xa swona i xa wasi kasi lexin'wana i xo tshwuka'. Ku fananisa swi hi mayelana na ku kuma vuxaka exikarhi ka michumu hi ku ya hi swihlawulekisi swo kongoma. Xikili lexi xi yisa eka vuswikoti bya ku ntlawahata michumu.

ku hlayela hi ku bela enhlokweni ku hlayela ehenhla, ku vula tinomboro hi nandzelelano lowu nga lulama (swi tlhela swi tiveka hi ku hlayela ka mpfumawulo kumbe ku hlayela ka swanomu)

ku hlayela ka mitsengo ku hlayela michumu ku kuma leswaku i 'swingani' (swi tlhela swi tiveka hi ku va ku hlayela ka xin'wexin'we)

ku hlayela ka mpfumawulo ku hlayela ehenhla, ku vula tinomboro hi nandzelelano lowu nga lulama (swi tlhela swi tiveka hi ku va ku hlayela ka swanomu kumbe ku bela enhlokweni)

ku hlayela ka swanomu ku hlayela ehenhla, ku vula tinomboro hi nandzelelano lowu nga lulama (swi tlhela swi tiveka hi ku va ku hlayela ka mpfumawulo kumbe ku bela enhlokweni)

ku hlayela ka xin'wexin'we ku hlayela michumu ku kuma leswaku i 'swingani' (swi tlhela swi tiveka hi ku va ku hlayela ka mitsengo)

ku pananisa ku kuma xihlawulekisi xo fana hi michumu mimbirhi kumbe kutlula, xik. michumu hinkwayo ya xitshopana. Ku pananisa i xikili xa nkoka xa ku dyondza ku yelana ka xin'we-eka-xin'we.

ku xaxameta ku forisa michumu kumbe swiendleko swinharhu kumbe kutlula eka landzelelana, xik. ntirho wa le kamareni ro dyondzela wa siku na siku, ntirho wa nimixo wa siku na siku wa vadyondzi ('endzhaku ka loko ndzi pfukile ndzi xika emubedweni, ndzi hlamba xikandza xa mina, ndzi dya mfihlulo wa mina …') kumbe swiendleko eka xitori

ku xiya ku tirhisa switwi swa hina ku kumisisa hi mayelana na michumu, swiendleko na maehleketelo. Hi fanele ku xiya ku hlengeleta vuxokoxoko hi mayelana na misava, xik. ku languta na ku yingisela hi vukheta eka leswi swi humelelaka ekusuhi na hina.

kwatsa kongomaka, nkhaqato

makambelelo yo aka makambelelo lama ma nyikaka vuxokoxoko loko ku dyondza swi ri eku endlekeni naswona swi pima ku ya emahlweni ka matirhelo ya vadyondzi

matirhelo ya nhluvukiso lama yaka emahlweni malongolokelo lama swikili na minongoti swi akaka hawona ehenhla ka xin'wana

matirhiselo tindlela to hambanahambana ta ku tirhisa minongoti na swikili swa matematiki, xik. ku kambisisa cinci ya wena evhengeleni, ku hlayela mali ya wena yo hakela thekisi, kumbe ku avanyisa phakiti ra timanga exikarhi ka vanghana vanharhu

matlhelo ma2 (2-D) xivumbeko xi na matlhelo mambirhi: vulehi na vuanami (anama)

matlhelo ma3 (3-D) nchumu wu na matlhelo manharhu: vulehi, vuanami (anama) na vulehelahenhla

miehleketo ya xivangelo miehleketo leyi vangaka mianakanyo kumbe xitatimente

mifungho swilo leswi swi yimelaka kumbe ku va ematshan'weni ya xin'wana xo karhi, xo tanihi mfungho wa nomboro, logo kumbe mfungho wa le gondzweni

observing using our senses to find out about objects, events and attitudes. We need to observe to gather information about the world, e.g. looking and listening carefully to what is happening around us.

oral counting counting out loud, saying the numbers in the correct order (also known as acoustic or rote counting)

ordering lining up three or more objects or events in a sequence, e.g. the daily classroom routine, the learners' morning routine ('after I wake up I get out of bed, wash my face, eat my breakfast …') or the events in a story

orientation how objects are placed in relation to each other

pattern the regular sequence of objects, movements or events that are repeated in a predictable way

perspective the effect of distance or depth on the appearance of objects

pictograph a way of representing data using pictures

predict to say or estimate what will happen in the future

principle a general rule that is accepted to be true

prior knowledge what learners know from before and can already do

property the characteristics of a 2-D shape or 3-D object, e.g. length, width, height, sides (faces), edges, corners

rational counting counting objects to find out 'how many' (also known as resultative counting)

reasoning the thinking behind an idea or statement

relate how objects and ideas are connected to each other

represent to use objects, symbols or actions to stand for an idea or concept

resultative counting counting objects to find out 'how many' (also known as rational counting)

rote counting counting out loud, saying the numbers in the correct order (also known as acoustic or oral counting)

sensory perceptual skills using your senses to gather information about your environment, for example: seeing, hearing, touching, smelling and tasting

sequence the particular order in which objects, movements or events follow each other

sorting finding things that are the same, or alike, and grouping them by specific features. First sort by one feature, such as colour, e.g. 'all the green shapes'. Then sort by two features, such as colour and size, e.g. 'all the small, green shapes'.

subitising the cognitive ability to immediately recognise the total number of objects in a collection without counting

symbols things that represent or stands for something else, such as a number symbol, logo or road sign

symmetry when a shape or object can be divided into two equal halves along a central line

3-dimensional (3-D) an object has three dimensions: length, breadth (width) and height

2-dimensional (2-D) a shape has two dimensions: length and breadth (width)

volume the amount something is holding or the space the contents take up

mpimo 'i ntsengo wo tanihikwihi' wa swa swin'wana, xik. vulehelahenhla, vulehi, ntiko, vholumu, vundzeni

nandzelelano nongoloko wo karhi lowu michumu, mifambafambo kumbe swiendleko swi landzelelanaka hayona

nawu xiboho xo angarhela lexi xi amukeriwaka ku va ntiyiso

ndzemuko nkucetelo wa mpfhuka kumbe vuenti eka mavonakelo ya michumu

ndzinganiso loko xivumbeko kumbe nchumu wu kota ku avanyisiwa hi tihafu timbirhi to ringana hi leka ntila wa le xikarhi

nkatsahinkwavo endlelo ra ku tiyisisa leswaku vana hinkwavo, swi nga ri na mhaka na ku va hambana, va katsiwa eka migingiriko hinkwayo ya kamara ro dyondzela

nongoti muanakanyo kumbe miehleketo. Hi marito man'wana, a swi nge koti ku khumbiwa. Minongoti ya matematiki yi katsa nomboro, ku hlayela, ndhawu, ku hlanganisa na ku susa.

ntiko hilaha xin'wana xi tikaka hakona

ntlawahata endlelo ro ntlawahata michumu yo yelana hi ndlela ya xisisitematiki, xik. ku hambanisa swiambalo swa xixika na ximumu

n'wangulana ku vulavurisana na vanhu van'wana; ku endla migingiriko na vanhu van'wana

patironi malongolokelo ya ntolovelo ya michumu, mifambafambo kumbe swiendleko leswi swi vuyeleriwaka hi ndlela yo vhumbeka

phikitogirafu ndlela ya ku endla vuyimeri bya vuxokoxoko bya tinhlayo hi ku tirhisa swifaniso

swikili swa ku vona swo twiwa ku tirhisa switwi swa wena ku hlengeleta vuxokoxoko hi mayelana na mbangu wa wena, tanihi xikombiso: ku vona, ku twa, ku khumba, ku nuheta na ku ringeta

swiphemu michumu, mifambafambo kumbe swiendleko leswi nga eka patironi

vholumu ntalo lowu xin'wana xi nga wu khoma kumbe ndhawu leyi leswi nga endzeni swi yi tekaka

vhumba ku vula kumbe ku kumbetela leswi swi nga ta humelela eka nkarhi lowu taka

vhumba ntsengo vuswikoti bya ku twisisa ku lemuka xikan'wekan'we ntsengo hinkwawo wa michumu leyi nga eka nhlengelo handle ko hlayela

vonakelo hilaha michumu yi vekiweke hakona ku ya hi mfambelano wa yona vini

vuhlanganisi nghingiriko wa nhlanganelo laha munhu loyi a tivaka swo tala kumbe a nga na swikili leswi hluvukisiweke hi ndlela ya le henhla swinene ku letela van'wana ku dyondza swin'wana swintshwa

vundzeni ntalo wa le henhlahenhla kumbe wa lowukulukumba lowu xin'wana (xo tanihi bakiti kumbe bokisi, kumbe rivala ra mitlangu) xi nga wu pangaka

vutivi bya nkarhi lowu nga hundza leswi vadyondzi va swi tivaka kusuka eka nkarhi lowu nga hundza na leswi se va nga swi endlaka

vuyimeri ku tirhisa michumu, mifungho kumbe swiendlo ku yimela muanakanyo kumbe nongoti

xakelana hilaha michumu na mianakanyo swi nga na vuxaka hakona

xianakanyiwa mianakanyo, miehleketo kumbe matitwelo

xihlawulekisi (1) swihlawulekisi swa xivumbeko xa 2-D kumbe nchumu wa 3-D, xik. vulehi, vuanami, vulehelahenhla, matlhelo (swikandza), makumu, tikhona; (2) xikombo kumbe xihlawulekisi xa xin'wana, tanihi xikombiso, muhlovo kumbe xivumbeko

yuniti leyi nga riki ya ntolovelo yuniti ya mpimo leyi yi tirhisaka nchumu wo tanihi ntangu, ximanyisamaphepha kumbe khiyubu; yi nga tlhela yi va nchumu wa nkamafundza wo tanihi vunavi bya xandla, nkondzo kumbe vulehi bya miri

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