Lenaneotokafatso la Dipalo tsa Mophato R

Grade R Mathematics Improvement Programme

Kaedi ya Mogopolo
Concept Guide

Setswana | English

Lenaneotokafatso la Dipalo tsa Mophato R

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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 Western Cape Education Department (WCED) officials and teachers for their contribution to the successful implementation of the Grade R Mathematics Programme (*R-Maths*) in the Western Cape between 2016 and 2019.
- 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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Porojeke ya Lenaneotokafatso la Dipalo tsa Mophato R ke itshimololelo ya **Lefapha la Thuto la Gauteng (Gauteng Department of Education)** mmogo le badirisani ba bona ba botlhokwa, **Gauteng Education Development Trust**.

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

Porojeke ya Lenaneotokafatso la Dipalo tsa Mophato R e laolwa ke **JET Education Services** mmogo le **Schools Development Unit** ya **UCT** le **Wordworks** jaaka badirisani ba setegeniki.

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

Kgatiso eno ya dibukana tsa dipalo e ungwetswe go tswa mo dipuisanong tsa tirisano le badiri ba Wordworks mme e bile gape e tokafaditswe ke go itepatepanya le dibukana tsa Lenaneotokafatso la Dipuo. E nontshitswe ke tiro ya badiri ba legoro la Kgodiso ya Bana ba Bannye go sale gale le Kgato ya Motheo ba ba direlang Sedika le Porofense mo Lephateng la Kharikhulamo kwa Lefapheng la Thuto la Gauteng mme e bile ba nnile le seabe se se seng kana ka sepe mo ditennyeng tsa dibukana le go dira go tlala seatla go netefatsa gore go na le nyalanyo le dipholisi, ditiragatso le ditsabotlhokwa tsa porofense.

DITEBOGO

Ditebogo di lebisiwa segolobogolo go:

- Batlhankedi ba Lefapha la Thuto la Gauteng mo Lephateng la Kharikhulamo, Bokaedi jwa Thuto ya Barutabana le Thuto e e Kgethegileng ka ntlha ya seabe sa bona go dirisa dibukana tseno tsa rona.
- Badirammogo le rona go tswa kwa Wordworks, badirammogo le rona ba setegeniki mo puong mo porojekeng ya Lenaneotokafatso la Dipalo tsa Mophato R, tebang le go dira mmogo le rona go kwala dibukana tseno.
- Badiri le barutabana ba Western Cape Education Department (WCED) ka ntlha ya seabe sa bona mo go netefatseng gore Grade R Mathematics Programme (*R-Maths*) e a diragadiwa mo Kapabophirima magareng ga 2016 le 2019.
- Setlhopha se se kwalang *R-Maths*: badiri ba Kgodiso ya Bana ba Bannye ba WCED, Cally Kuhne, Karen Kaimowitz, Bev Da Costa, Meryl Glaser, Sue Bailie, Sue Connolly, Sue Heese.

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Moralaletlharentle: Jacqui Botha

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Diteng

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

Ketapele go tswa go Tlhogo ya Lefapha

Morutabana/Modiri yo o rategang

O a amogelwa mo katisong ya barutabana/badiri ya Mophato R. Lefapha la Thuto la Gauteng (Gauteng Department of Education (GDE)) le sweditse go tsaya tsia Kgodisopele ya Bana jaaka Phitlhelelo ya Togamaano 1. Seno ke go netefatsa gore re ala motheo o o tiileng le phetiso e e se nang matsapa ya barutwana go ya kwa Mophato 1.

Porojeke ya Lenaneotokafatso la Dipalo tsa Mophato R e diretswe go tlamela barutabana/badiri ba Mophato R ka *tshegetso* e e tlhokagalang tota ya phaposiborutelo mo Gauteng. E ka ga ditiragatso tsa phaposiborutelo tse di nang le malepa le ditsela tse di itumedisang mme e bile di le maleba le go ruta le go ithuta mo Mophato R. Seno ke ka ntlha ya go tsibogela patlisiso e e begang gore 65% ya bana go ralala naga ga ba ise ba kgone go tshwarelela dikgono tse di tlhokegang go ba kgontsha go atlega mo go ithuteng go buisa le dipalo fa ba tsena mo Mophato 1. Maitlhomo a porojeke eno ke go tshegetsa barutabana/badiri ba Mophato R go mekamekana le kgwetllho eno.

Tsholofelo ya Lefapha ke gore o bo o ikeetleleditse go ithuta le gore o bo o le morutabana/modiri yo o katisitsweng wa Mophato R. Boineelo jwa gago mo katisong le tsenyotirisong ya se o se *rutilweng* mo phaposiborutelong *ya gago* di tlaa nna le seabe mo go tokafatseng iketleetso ya morutwana wa Mophato R go tsena mo Mophato 1.

Re tshepa fa tsereganyo eno e tlaa thusa go tiisa bokgoni, boitshimololedi le boitlhamedi jwa gago fa o tlaa bo o ala motheo wa thuto ya bana ba rona. Porojeke eno e ne e ka se atlege ntle le botsayakarolo jwa banaleseabe. Lefapha la Thuto la Gauteng (GDE) le leboga tshegetso ya ditheo tse di ntseng le seabe mo tirong eno go menagane jaaka GEDT, Zenex Foundation le USAID ka tlaleletso ya bona mo lenaneong le.

Ke tshepa fa lo tlaa ungwelwa go le gontsi mo lenaneokatisong leno le go tokafatsa thulaganyetsothuto ya bana ba bannye ba ba mo tlhokomelong ya lona.

Weno

Rre Edward Mosuwe

Tlhogo ya Lefapha: Lefapha la Thuto la Gauteng

3 Seetebosigo 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.

KAROLO 1

Lenaneotokafatso la Dipalo tsa Mophato R *(Grade R Maths)*

Matseno

Grade R Maths ke lenaneo la pele la dipalo tsa Mophato R tse di nyalantsweng le go atolosa Dipalo tsa Mophato R mo PPKT. Lenaneo la *Grade R Maths*:

- le tlhametswe go tlamela ka letlhomeso la go ruta le go ithuta dipalo mo Mophatong wa R
- le ikaegile ka melawana ya go ruta e e mmalwa e e rotloetsang go ithuta ka katlego
- le tlhalosa megopolo e e botlhokwa go tokafatsa kitso ya dipalo mo baneng ba bannye
- le latedisa diteng tsa dipalo tsa Mophato R le go neelana ka malepa a a kgonagalang mo phaposiborutelong
- le neela barutabana kaelo e e tshegetsang thulagayetsothuto ya bona ka botlalo.

Lefoko 'dipalo' le dirisitswe ka ditsela tse di farologaneng mo bukeng e. Fano go supiwa ka moo le dirisitsweng ka teng le bokao jwa lereo lengwe le lengwe:

- **dipalo** ke mofuta wa kitso e e akaretsang megopolo, dikgono le ditiragatso
- **Dipalo tsa Mophato R** ke kharikhulamo mo Pegelong ya Pholisi ya Kharikhulamo le Tlhatlhobo (PPKT)
- ***Grade R Maths*** ke leina la lenaneo leno la pele la dipalo tsa Mophato R
- **dipalo mo Mophatong wa R** ke mofuta wa dipalo tse di ithutiwang mo Mophatong wa R.

Mo kaeding eno, lefoko 'bana' le dirisiwa go bua ka bana pele ga ba tsena mo Mophatong wa R. Lefoko 'mo/barutwana' le dirisiwa go bua ka bana ba ba mo Mophatong wa R.

Diponagalo tsa *Kaedi ya Mogopolo* di akaretsa:

- tshedimosetso ka ga go rutiwa le go ithuta dipalo
- **'Ka go ikatisa'** mabokoso a a neelanang ka dikao tsa gore melawana le dikakanyo tse di mo bukeng eno di ka dirisiwa jang ke barutwana kgotsa le bona
- mabokoso a **lenaanefoko** le le neelang bokao jwa mafoko a a ka tswang a le maswa kgotsa thata go tlhaloganyesega
- lenaane la lenaanefoko la mafoko a maswa a a dirisitsweng mo bukeng e.

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.

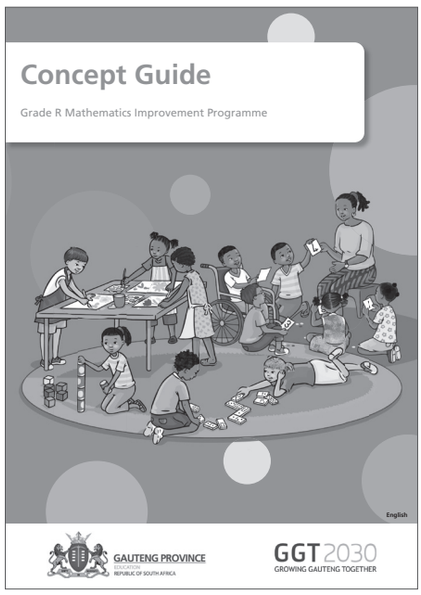


Figure 1 The *Concept Guide*

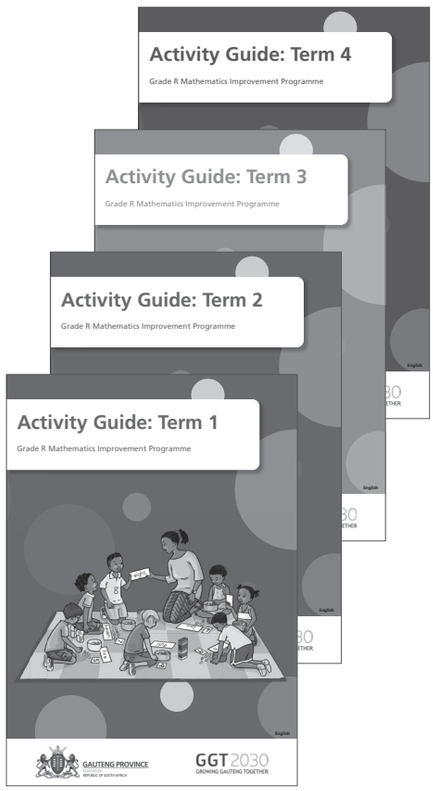


Figure 2 *Activity Guides* Term 1–4

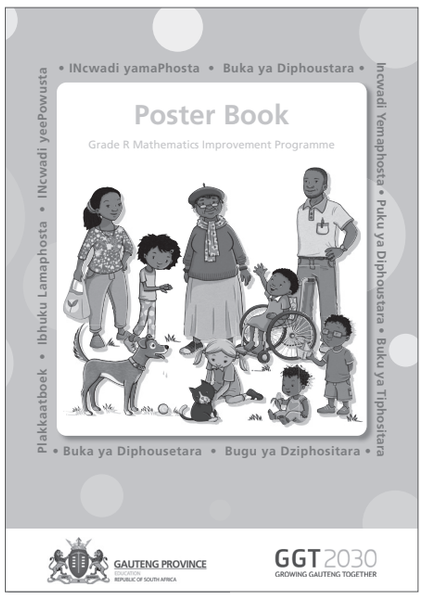


Figure 3 The *Poster Book*

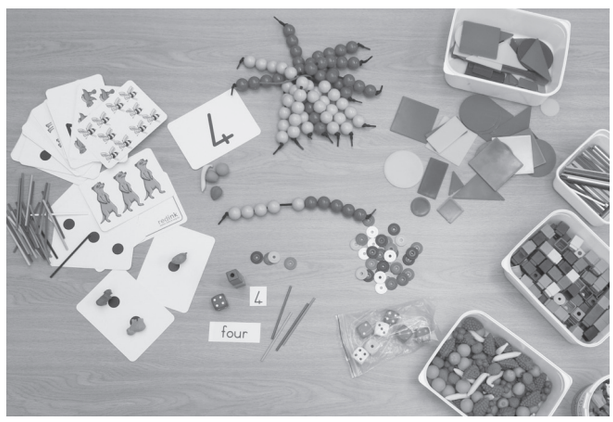


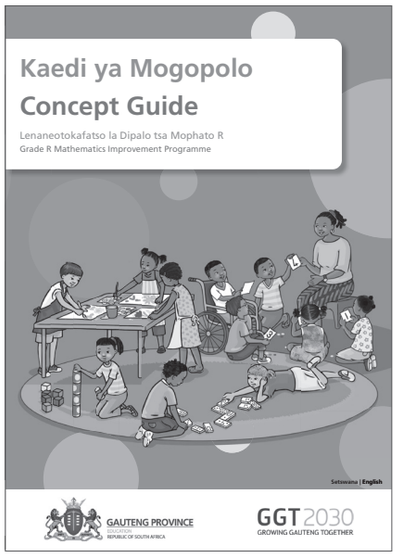
Figure 4 *Resource Kit*

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

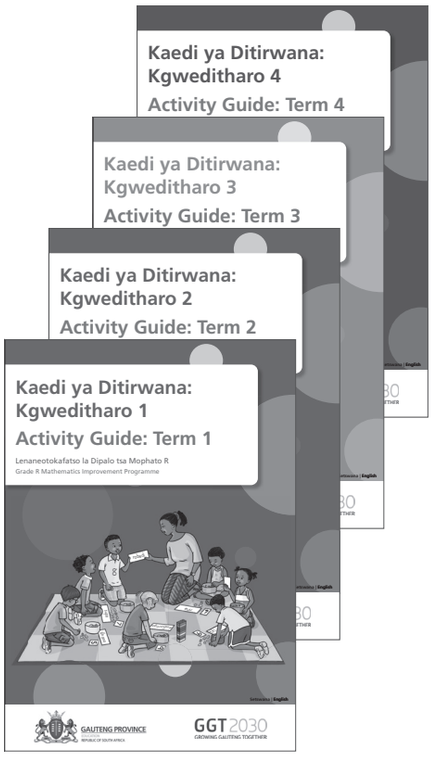
Grade R Maths

Go na le dikarolo tse nne go *Grade R Maths*:

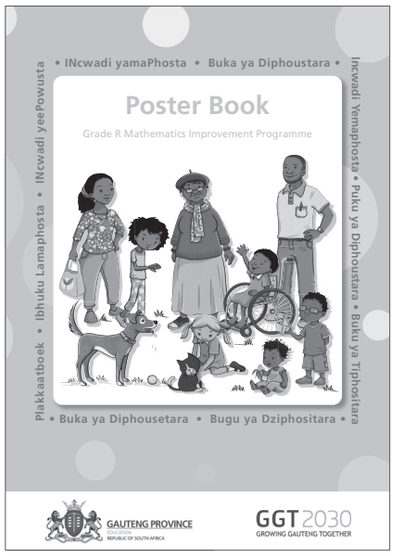
- *Kaedi ya Mogopolo*
- *Dikaedi tsa Ditirwana* di le nne – e nngwe le e nngwe ke ya kgweditharo e nngwe le e nngwe ya sekolo – e e neelang barutabana ba Mophato R ka ditshitshinyo tsa beke le beke go ruta le go ithuta dipalo
- *Buka ya Diphousetara* e e nang le diphousetara di le lesomenngwe
- *Kgetsana ya Didiriswa* tsa phaposiborutelo e e nang le didiriswa tsa dipalo tsa barutwana ka nosi le ditlhopha tse dinnye tsa go ithuta.



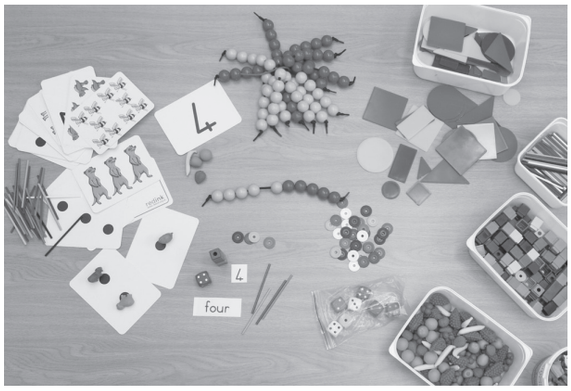
Setshwantsho 1
Kaedi ya Mogopolo



Setshwantsho 2 *Kaedi ya Ditirwana Kgweditharo 1–4*



Setshwantsho 3 *Buka ya Diphousetara*



Setshwantsho 4 *Kgetsana ya Didiriswa*

O ka tsenya tshedimosetso ya tlaleletso mo karolwaneng e nngwe le e nngwe ya *Grade R Maths* mo *Kaedi ya Mogopolo* eno.

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

Melawana e e kaelang go ruta dipalo mo Mophato R

Grade R Maths e rotloetsa tsela ya go ruta le go ithuta e e tlhotlheletsang le go gwetlha barutwana. Barutwana ba tlaa godisa kitso le dikgono tse ba tlaa agelelang mo go tsona mo mephatong e e kwa pele. Patlisiso ya thuto mo diphaposiborutelong e beile pontsheng **melawana** e le mmalwa ya go ruta, e e nang le seabe mo go ithuteng ka katlego. Lenaneo la *Grade R Maths* le ageletswe mo melawaneng eo e le robedi.

LENAANEFOKO

molawana
molawana wa kakaretso o o amogetsweng jaaka boammaaruri

1. **Molawana wa bokaelo.** Go rutega go diragala mo maemong a a amogelesegang e bile a le maleba.

8. **Molawana wa tiragatso.** Go rutega go lotaganngwa ka tiragatso ya dikgono tse dišwa le kitso.

2. **Molawana wa ditirwana.** Barutwana ba tshwanetse go nna le seabe ka tlhamalalo mo go rutweng le go ithuteng.

7. **Molawana wa kakaretso.** Go rutega go diragala mo tikologong e mongwe le mongwe a ikutlwang a amogelesegile, a akarediwa, a tshwerwe sentle, a tlotliwa mme e bile a na le seabe.

8
MELAWANA E LE ROBEDI YA *GRADE R MATHS*

3. **Molawana wa motshameko.** Barutwana ba rutega thata mo ditirwaneng tsa go tshameka ka tokologo le tse di kaelwang ke morutabana.

6. **Molawana wa go kaelwa.** Go rutega go diragala fa barutabana ba kaela barutwana mo go ageng kitso e ntšhwa.

5. **Molawana wa tirisano.** Thuto e diragala fa go na le tlhaeletsano le thefosano ya dikakanyo.

4. **Molawana wa maemo.** Barutwana ba feta mo maemong a a farologaneng a go tlhaloganya le kgolo.

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.

Le fa melawana e robedi e ya go ruta e neetswe e kgaogantswe, e lomagane fela yotlhe.

Karolo e e latelang ya *Kaedi ya Mogopolo* e go tlhalosetsa ka ga melawana e le robedi e *Grade R Maths* di ikaegileng ka yona. Melawana e robedi e na le:

- tlhaloso
- lebokoso la 'Ka go ikatisa'
- tshedimosetso ya tlaleletso tebang le molawana.

1. Molawana wa bokaelo

Tlhaloso

Go rutega go diragala fa maemo (kgotsa bokaelo) bo na le bokao mo morutwaneng. Go le gantsi, dikao tsa mefuta ya dipalo tse di tlhokang tharabololo di akaretsa megopolo ya dipalo e e tswang mo maemong a dilo tse di leng mo botshelong. Barutwana ba bona go le bonolo go rarabolola mathata a ba ka ikamanyang le ona go ya ka maitemogelo a bona a botshelo.

Ka go ikatisa ...

Go na le ditšhono tsa go ithuta dipalo mo bontsing jwa ditirwana tsa phaposiborutelo le tsa kwa gae. Dikgwetlho tsa barutabana le batsadi ke go lemoga fa go na le dikgwetlho tseno le go di dirisa jaaka matantabelo a se barutwana ba setseng ba se itse.

Go le gontsi ka ga molawana wa bokaelo

Dipalo tsa pele kwa gae

Maitemogelo a bana ba gago kwa gae le mo metshamekong ya kwa ntle a ala motheo wa gore ba tlhaloganye **megopolo** ya botlhokwa ya dipalo.

Masea, bana le bana ba bannye ba dirisa ditemosi tsa bona go ithuta lefatshe le le ba dikologileng. Ba supa kgatlhego mo dibopegong tse di sa reng sepe, ba tlhama dipaterone tse di bonolo mme e bile ba kgona go ithuta go bala pele ga ba tsena sekolo. Ba ithuta ka ga lefatshe fa ba ntse ba bua, ba ja le go tshameka, ka yona nako eo ba ithuta megopolo ya dipalo. Sekao:

- Fa ba leka go tsenya dilo tse dikgolo mo melomong ya bona, ba lemoga le go tlhaloganya bogolo.
- Fa ba dirisa mabokoso le mateng a dipampitshana tsa kwa ntlwaneng go itirela dikoloi tsa maitlhomo, ba tokafatsa temosi ya sebopego.
- Fa ba leka go tsholetsa selo se se boima, ba simolola go tlhaloganya mogopolo wa boima.
- Fa ba bona ditshwano le dipharologantsho magareng ga dilo tse dinnye tse di kgobokaneng, ba a di nyalanya, rulaganya le go di bapisa.

Bana ba bannye ba simolola go bopa dikakanyo tebang le megopolo ya dipalo pele ba ka simolola go rutiwa dipalo kwa sekolong.

LENAANEFOKO

mogopolo
mogopolo kgotsa kakanyo. Ka mantswe a mangwe ga e ka ke ya angwa. Megopolo ya dipalo e akaretsa dipalo, go bala, sebaka, go tlhakanya le go ntsha.

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

Ditirwana tsa bana tsa letsatsi le letsatsi kwa gae di tletse ka ditšhono tsa go ithuta dipalo go sa le gale. Sekao:

- ka nako ya meetlo ya letsatsi le letsatsi, sk. ka nako ya dijo, ya go tlhatswa, ya go apara le ya go phutha dilo
- fa ba dirisa dilo, sk. ba tswala dikupu le go sega ka sekere
- fa ba tshameka, sk. fa ba abelana dilo, ba dira e kete ba a apaya kgotsa ba dira e kete ba kgweetsa thekesi
- fa ba thala le go penta
- fa ba etsisa bagolo ka go bala.

Ditirwana tseno di dira gore bana ba itshepe. Gape di godisa kitso ya bona le go tlhaloganya ga bona lefatshe le le ba potologileng.

Setshwantsho 6 Tiriso ya ditirwana tsa letsatsi le letsatsi go tlhotlhomisa megopolo ya dipalo

Go tlhaloganya megopolo ya dipalo mo baneng ba bannye go tsaya nako go gola.

- Ba ithuta gore dinomore di na le bokaakang kgotsa selekanyo se se amanngwang le tsona se se sa fetogeng, sk. fa ngwana yo o nang le dingwaga di le tharo a tsharolola menwana e meraro go bontsha selekanyo 'tharo'.
- Ba ka boeletsa tatelano ya dipalo, sk. 'nngwe, pedi, tharo, thataro, lesome'. Fa ba dira seno ba etsisa bagolo ka go dirisa mafoko a dipalo ntle le go nna le go tlhaloganya go go tseneletseng ga se ba se kayang.

Fa bana ba ntse ba tshameka ba le bosi kana le bana ba bangwe, le fa ba ntse ba **dirisana** le bagolo ba ba ba potologileng, ba simolola go nna le dikakanyo mabapi le megopolo ya dinomore, sebopego, dibaka le tekanyo.

Megopolo e bana ba simololang go nna le yona kwa gae fa ba ntse ba dira ditirwana tsa letsatsi le letsatsi nakonngwe di bidiwa 'kitso ya letsatsi le letsatsi'. Sekao sa seno ke fa bana ba ntshetsa mongwe le mongwe yo o jang sejana ba bo ba ntshetsa sejana sengwe le sengwe leswana. Fa ba dira jalo, ba ithuta ka nyalanyo ya bongwe ka bongwe.

LENAANEFOKO

dirisana
tlhaeletsana le batho ba bangwe; go dira ditirwana le batho ba bangwe

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

Dipalo mo bokaelong jwa sekolo

Batho ba le bantsi ba akanya gore dipalo ke ka ga dinomore le go rarabolola dipalo mme seno ke karolo ya dipalo e e bidiwang dipalo (*arithmetic*). Tota dipalo di akaretsa megopolo le dikgono tse di farologaneng. Mme e bile e akaretsa ditsela tse di farologaneng tsa go dirisa megopolo le dikgono tse. Tseno di bidiwa '**ditiragatso**'. Ka jalo fa re bua ka dipalo re raya megopolo ya dipalo, dikgono le ditiragatso.

Bana ba dirisa megopolo ya dipalo letsatsi le letsatsi le fa ba sa akanye e le go dira dipalo. Ba diragatsa megopolo ya dipalo fa ba tlatsa kopi ntle le go tsholola, go itse gore ba tshwanetse go dirisa setshodi sefe go lekanya diboloko tsotlhe, fa ba ya marekelong kgotsa ba bua gore re na le dilo di le kae.

LENAANEFOKO

ditiragatso
ditsela tse di farologaneng tsa go dirisa megopolo le dikgono, sk. go tlhola poelo ya gago ya madi mo lebenkeleng, go bala madi a go palama thekesi, kgotsa go aroganya pakete ya matonkomane magareng ga ditsala tse tharo

Setshwantsho 7 Rotlhe re dirisa megopolo ya dipalo letsatsi le letsatsi – go tlhopha lebokoso la bogolo jo bo nepagetseng.

Kwa sekolong, bana ba agelela mo kistong eno, sekao, fa ba rulaganya dilo ka ditlhopha mme ba bapise nomore ya dilo mo setlhopheng sengwe le sengwe. Jaanong ba ithuta go bala ka go dirisa tatelano e e nepagetseng ya dinomore mme ba dirise tsamaelano ya bongwe ka bongwe go batlisisa palogotlhe mo kokoanong. Seno se bidiwa 'kitso ya sekolo'.

Kitso ya letsatsi le letsatsi
papiso, thulaganyo, nyalanyo, go bitsa mainapalo, o ithuta ka bontsi/bonnye, kgolo/nnye, bofefo/bokete

Kitso ya sekolo
Matshwao le mafoko

- Dinomore, Ditiro le Dikamano ('Dipaterone, Matshwao le Dikgolagano')
- Dipaterone, Ditiro le Alejibora ('Dipaterone, Ditiriso le Alejebera')
- Boalo le Popego (Jeometeri)
- Tekanyo
- Go Ranola Tshedimosetso ('Dipalo tsa Tshedimosetso')

Setshwantsho 8 Kgolagano magareng ga kitso ya letsatsi le letsatsi le kitso ya sekolo

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.

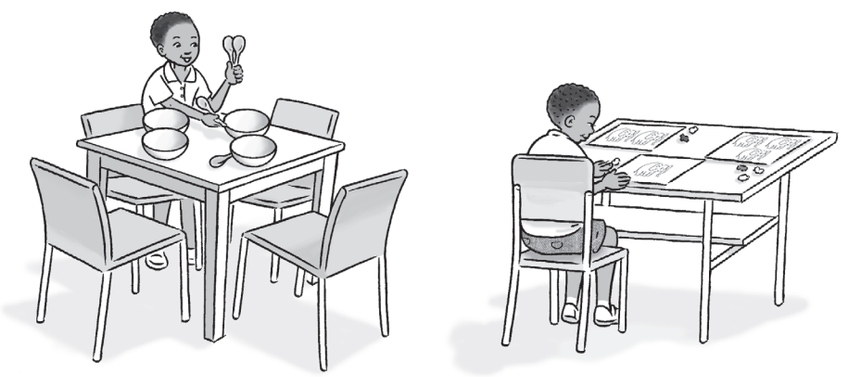


Figure 9 Counting and one-to-one matching at home and at school

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

Fa bana ba fitlha mo Mophato R, ba tla ka maitemogelo a bona mmogo le dikakanyo tsa bona tsa gore ba tlhaloganya lefatshe jang. Seno ke kitso ya bona ya letsatsi le letsatsi. Kitso ya letsatsi le letsatsi ga e ka ke ya tshwana mo baneng botlhe ka jaana e ikaegile ka lelapa la ngwana, baagi le setso. Kitso ya letsatsi le letsatsi nakonngwe e bidiwa **kitso ya pele** mme barutabana ba e dirisa go agelela mo go se barutwana ba setseng ba se itse le se ba kgonang go se dira.

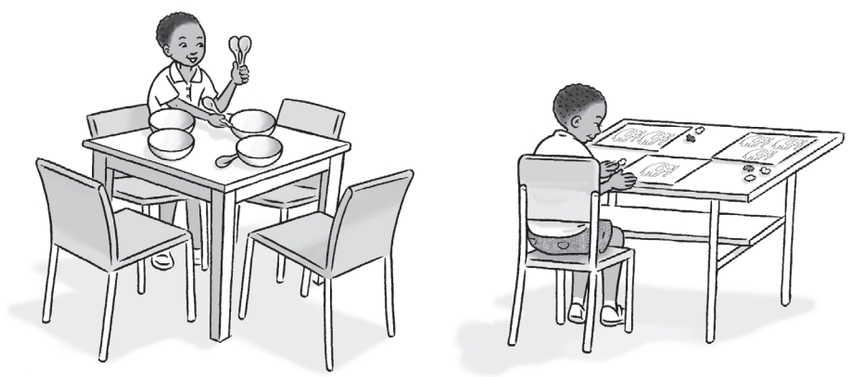
LENAANEFOKO

kitso ya pele
se barutwana ba tlang ba se itse le se ba kgonang go se dira

Mo Mophato R, barutwana ba tshwanetse go nna le tšhono ya go batlisisa, tlhotlhomisa le go lekeletsa dikakanyo tse diswa. Gape ba tshwanetse go rotloediwa go bua le morutabana wa bona le barutwana ba bangwe mabapi le se ba se dirang le se ba se akanyang. Barutwana ba tlhoka thuto e e nepagetseng go ba thusa:

- go akanya le go bua ka ga maitemogelo a bona ba dirisa puo ya dipalo
- go aga kitso e ntšhwa ya dipalo
- go godisa ka moo ba tlhaloganyang dipalo ka teng
- go nna le boitshwaro jo bo siameng mo dipalong.

Ba tlhoka go dira ditirwana tse di ba letlang go batlisisisa megopolo ya dipalo kwa gae le kwa sekolong le go bona fa dipalo di itumedisa le go kgatlhisa.



Setshwantsho 9 Go bala le nyalanyo ya nngwe ka nngwe kwa gae le kwa sekolong

Go baka maemo a a siametseng go ithuta dipalo

Barutabana ba tshwanetse go baka maemo a phaposi moo barutwana:

- ba ikutlwang ba babalesegile le go sireletsega
- ba tshepa moo ba ka itlhalosang
- ba nnang le seabe mo ditirwaneng tsotlhe.

Maemo a a bonagalang a go ithuta dipalo a tshwanetse go akaretsa:

- didiriswa (jaaka metshameko, dilo tsa go aga le diphazele) tse di rulagantsweng gore barutwana ba bone se se leng teng le go tlhopha se ba tlhokang go se dirisa
- ditšhono tsa go batlisisa le go tlhotlhomisa
- ditšhono tsa gore barutwana ba dirise dilo go rarabolola dipalo le go rekota ditharabololo tsa bona
- ditšhono tsa gore barutwana ba dirise puo ya dipalo, jaaka 'go feta', 'kgolo go', 'sekhutlo' le dinomore

- 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.

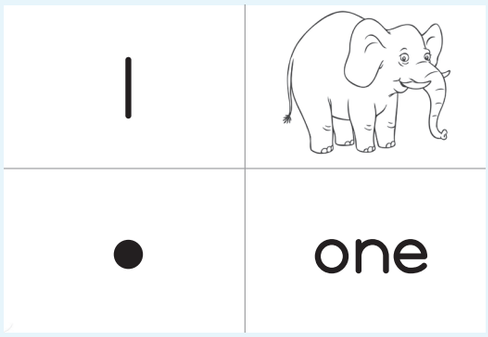


Figure 10 Number frieze

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.

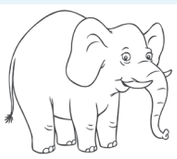
sorting
finding things that are the same, or alike, and grouping them by specific features. First sort by one feature, such as colour, e.g. 'all the green shapes'. Then sort by two features, such as colour and size, e.g. 'all the small, green shapes'.

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

- ditirwana tse di akaretsang **go ela tlhoko**, **go nyalanya**, **go bapisa**, **go rulaganya** le **go latedisanya**.

Ka go ikatisa ...

- Baakanya lefelo le le tletseng ka dilo tsa dipalo mo phaposiborutelong ya gago. Bapisa tafole le lebota gore matshwao, ditshwantsho le dilo di bewe gona le go buisanelwa.
- Baya tšhate ya maemo a bosa, khalentara, molapalo (mola wa dipalo) le dinomorekgabisi mo lefelong le mme o di dirise mo puisanong ya letsatsi le letsatsi.
- Bontsha tiro ya barutwana mo lefelong le.
- Rotloetsa barutwana go tla ka dilo tse lo ka buisanang ka tsona go tswa gae. Tlaleletsa ka tsona mo tafoleng ya dipontsho mme o neele barutwana ba ba tlileng ka tsona tšhono ya go bua ka tsona.

I	
•	nngwe

Setshwantsho 10 Nomorekgabisi

Setshwantsho 11 Lefelo la dipalo

2. Molawana wa ditirwana

Tlhaloso

Molawana wa ditirwana o kaya go ithuta ka go itirela. Barutwana ba tshwanetse go nna le seabe mo go ithuteng. Go ithuta dipalo mo Mophato R go tshwanetse ga akaretsa ditirwana tse di itumedisang tsa go itirela mme e bile di akaretsa dilo tsa letsatsi le letsatsi le maitemogelo a a nang le bokao. Mo go kgonagalang, ditirwana di tshwanetse tsa kgona go tlamela barutwana ka ditšhono tsa go dirisa mebele yotlhe ya bona le ditemosi, segolobogolo pono, kutlo le kgomô.

LENAANEFOKO

kelotlhoko
go dirisa ditemosi tsa rona go batlisisa ka ga dilo, ditiragalo le maitshwaro. Re tshwanetse go ela tlhoko go kokoanya tshedimosetso ka ga lefatshe, sk. go lebelela le go reetsa sentle se se diragalang mo tikologong ya rona.

go nyalanya
go supa dintlhatshwano mo dilong tse pedi kgotsa go feta, sk. dilo tsotlhe tse di serolwana. Go nyalanya ke kgono ya botlhokwa ya go ithuta tsamaelano ya bongwe ka bongwe.

go bapisa
go lebelela dintlhatshwano kgotsa dipharologantsho magareng ga dilo tse pedi kgotsa go feta, sk. 'tseno tsotlhe ke diphologolo mme e nngwe e tala fa e nngwe e le khibidu'. Go bapisa ke go batlisisa kamano magareng ga dilo o ikaegile ka diponagalo tse di rileng. Kgono eno e isa kwa bokgoning jwa go arologanya dilo.

go rulaganya
go batla dilo tse di tshwanang, kgotsa di tshwana mme o di baya ka dilthopha go ya ka diponagalo tse di rileng. La ntlha di rulaganye ka ponagalo e le nngwe, jaaka mmala, sk. 'dibopego tsotlhe tse ditala'. Jaanong di rulaganye ka diponagalo tse pedi jaaka mmala le bogolo, sk. 'dibopego tsotlhe tse dinnye di le ditala'.

go latedisana
go tlhomaganya dilo kgotsa ditiragalo tse pedi kana go feta ka tatelano, sk. meetlo ya letsatsi le letsatsi ya phaposiborutelo, meetlo ya mo mosong ya barutwana ('fa ke sena go tsoga ke tswa mo bolaong, ke tlhapa sefatlhego, ke ja sefitlholo ...') kgotsa ditiragalo mo kgannyeng

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.

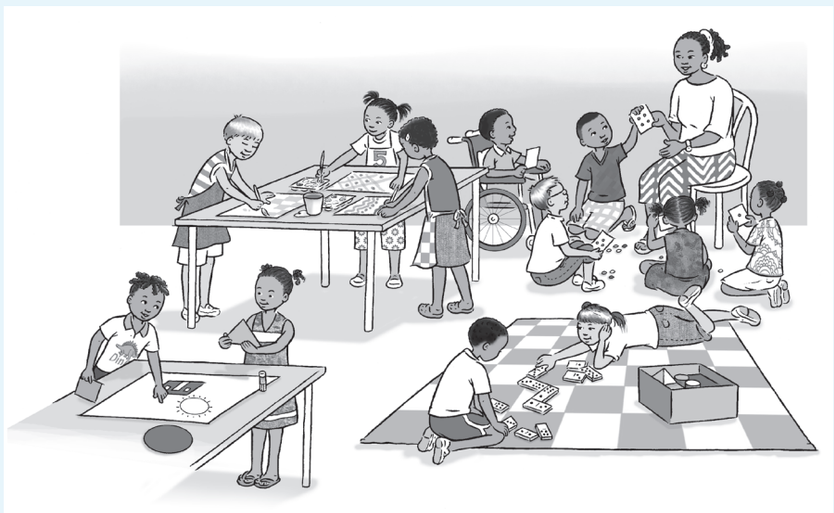


Figure 12 Children learn in hands-on activities.

Barutwana ba Mophato R ba tshwanetse go ithuta go bala le go latedisanya dinomore ka go dirisa dipina le merumo, ba dirisa ditiragatso le metshikinyego e megolo jaaka go opa diatla, go tlola le go kitima go emela dinomore fa ba ntse ba bala. Go bala ka tatelano, go kopolola dinomore go tswa mo botong le go kwala matshwaopalo mo gare ga mela ka phensele ga se mokgwa o o siameng thata go ithuta dinomore.

Barutwana ba tshwanetse go batla le go kokoanya dilo tse ba ka di balang le go di tshwaya ka mafokopalo le dikaratapalo. Ba tshwanetse go kwala matshwaopalo mo motlhabeng, ba di dire ka go dirisa Polasetisine (*Plasticine*), ba di pente kgotsa ba di gatise mo mokwatleng wa ditsala tsa bona. Mokgwa o o tsamaelana le mokwalo wa tshoganyetso mme o golaganya tshedimosetso ya letshwaopalo le leinapalo.

Fa o tlhagisa nomore e ntšhwa, ke kakanyo e e siameng go golaganya leinapalo, letshwaopalo, tiragatso le kokoanyo ya dilo ka go dirisa kanelo. Seno se ka dirwa ka go rotloetsa barutwana go bala dilo mo setshwantshong, go gopola palo ya dilo mo kanelong, kgotsa ba ka opa diatla, ba tlola kgotsa ba dirisa menwana ya bona go bontsha nomore mo kanelong.

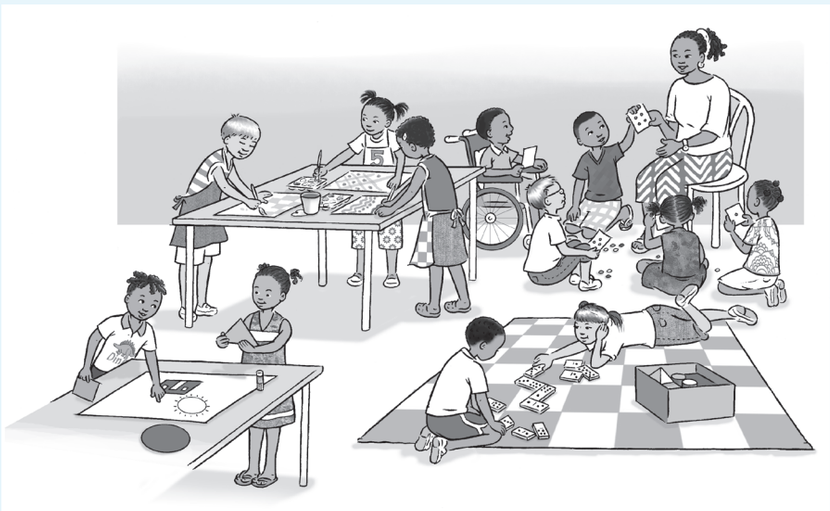
Ka go ikatisa ...

Morutabana o dira tse di latelang:

- O rulaganya ditirwana tse di ka dirwang ke barutwana mme di le maleba le bogolo, maemo a kgolo le dikgatlhego tsa bona.
- O gokaganya se barutwana ba setseng ba se itse le go se dira le dikakanyo tse dišwa, puo, megopolo le/kgotsa dikgono tse di tshwanetseng go ithutiwa.

Barutwana:

- ba lokologile go lekeletsa, go batlisisa le go botsa dipotso
- botlhe ba abelana dikakanyo le go botsa dipotso.



Setshwantsho 12 Barutwana ba ithuta ka go tsaya karolo.

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. Molawana wa motshameko

Tlhaloso

Motshameko o dirwa ke ditirwana tse di itumedisang le go rotloetsa kgolo le tlhôgôlô ya ngwana. Motshameko o na le dipoelo tsa maitsholo, loago, tlhago, kitso le maikutlo. Motshameko o letla bana go tsaya karolo mo thutong ya bona ka matlhagatlhaga le mo tlhotlhomisong ya tikologo ya bona. Go ithuta mo Mophato R go tshwanetse ga akaretsa ditirwana tsa go tsaya karolo le maitemogelo a a dirisang dilo tse dintsi tse di tshwaregang le **matshwao**.

LENAANEFOKO

matshwao
dilo tse di supang kgotsa emela sengwe, jaaka fa e le letshwaopalo, letshwaokgwebo kgotsa letshwaotsela

Go ithuta ka go tshameka

Mo baneng, go ithuta le go tshameka ga se dilo tse di aroganeng. Motshameko o ka kaya dilo tse dintsi, jaaka metshameko ya kwa ntle; go tshameka ka motlhaba kgotsa metsi; o dira jaaka e kete o tshameka le ditsala kgotsa o tshameka o le nosi; o tshameka ka diboloko kgotsa ditshamekisi tsa dikago; kgotsa o tshameka metshameko ya go reetsa kgotsa metshameko ya dikarata. Le fa ditirwana dingwe tsa metshameko di batla nako e e okeditsweng le didiriswa, bana go le gantsi ba itumedisiwa ke go tshameka ka dilo tsa letsatsi le letsatsi le dilo tse di bonolo tse di itiretsweng. Barutwana ba rutega ka go tshameka kwa gae le kwa sekolong. Ga se selo se barutwana ba se dirang fela ka 'nako ya bona ya go iketla' kgotsa fa morutabana a seyo.

Barutwana ba tlhoka ditšhono tse dintsi go:

- tlhotlhomisa tikologo ya bona ka go dirisa ditemosi tsa bona, sk. metshameko ya kwa ntle jaaka go palama le go taboga, kgotsa metshameko e e nang le melao e e tshwanetseng go latelwa jaaka sekotšhe le metshameko ya kgwele
- tlhotlhomisa le go rarabolola mathata, sk. go dirisa didiriswa tsa dikago go aga tora, kgotsa go dirisa metsi kana motlhaba go tlatsa ditshodi
- diragatsa se ba setseng ba se itse kgotsa ba itse go se dira, sk. go tshameka metshameko e e nang le thulaganyo jaaka dinoga le dillere kgotsa didomino.

Mefuta e metlhano ya metshameko

Babatlisisi ba supa fa go na le mefuta e metlhano ya metshameko e e fitlhelwang mo ditsong tsotlhe mme e tshegetsa kgolo ya ngwana ya tlhago, loago, maikutlo le kitso.

- **Motshameko wa katisommele** o akaretsa ikatiso ka matlhagatlhaga, katiso ya go kwala le go tshwara le motshameko wa go lwana. E botlhokwa mo tirisanong ya tiriso ya mesifa e megolo le go kwala le go tshwara le go maatlafatsa le go aga kgotlhelelo.
- **Go tshameka ka dilo** go akaretsa tlhotlhomiso, patlisiso le tekeletso ka dilo tse di farologaneng mo lefatsheng la bona. Seno se godisa dikgono tsa bona tsa go akanya le go rarabolola mathata.
- **Motshameko wa kaediso** ke fa bana ba dirisa ditshamekisi, dilo, ditshwantsho, dithalo kgotsa go dira matshwao go gongwe go emela dilo tsa nnete.
- **Go iketsisa le tiragatso ya loago** go akaretsa go apara le tshameko ya karolo. Seno se rotloetsa kgolo ya kitso le loago mme se thusa bana go laola maitsholo le dikakanyo tsa bona.
- **Metshameko e e nang le melao** e rotloetsa bana go latela melao ya motshameko, le go ithuta go refosana mmogo le go thusana.

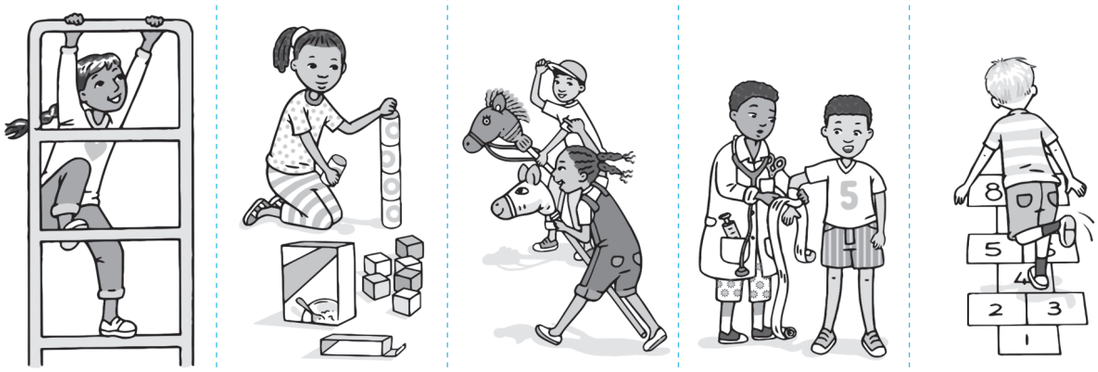


Figure 13 Types of play

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.

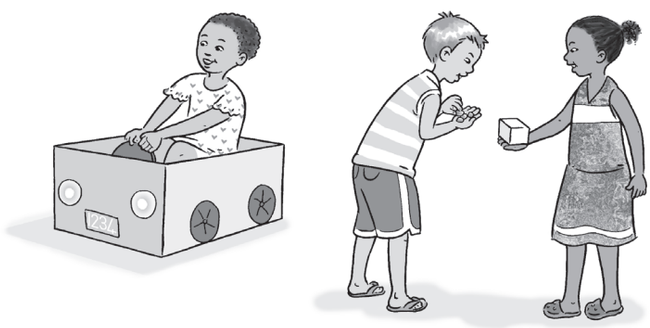


Figure 14 A cardboard box can represent a car, a wooden block can represent an apple and stones can represent money.

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.

Motshameko wa katisommele

Tshameka ka dilo

Motshameko wa kaediso

Go iketsisa le tiragatso ya loago

Metshameko e e nang le melao

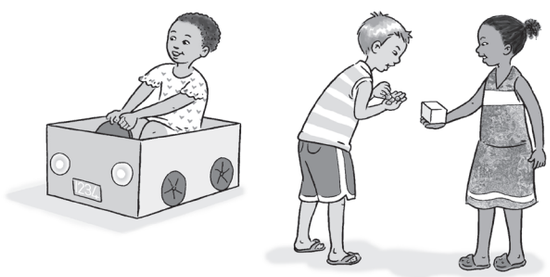
Setshwantsho 13 Mefuta ya metshameko

Mokgwa o o ikaegileng ka motshameko

Mokgwa o o ikaegileng ka motshameko mo go rutweng le mo go ithuteng o etse tlhoko gore ka dinako dingwe bana ba rutega sentle thata go tswa-mo ditirwaneng tse di lokologileng tse di itshimololetsweng ke ngwana kwa ntle ga seabe sa mogolo. Ka dinako tse dingwe barutwana ba rutega sentle thata go tswa mo ditirwaneng tsa motshameko mo kaelong ya morutabana go phaposiborutelo yotlhe kana ditlhopha tse dinnye. Lenaneo la go ruta le go rutiwa le le rulagantsweng sentle le tshwanetse go akaretsa maleka a ditirwana tse di farologaneng tsa metshameko.

Go ithuta megopolo ya dipalo ka go tshameka

Go le gantsi motshameko o akaretsa bana ba tsaya dikarolo tsa bagolo. Sekao, ba ka etsisa bagolo ka go apaya, kgotsa mofofisasefofane a fofisa sefofane, kgotsa morutabana a ruta. Mo metshamekong eno, go le gantsi ba dirisa dilo tse di mo tikologong ya bona mme ba dire jaaka o ka re ke dilo dingwe, sk. boloko jwa kago jwa lepolanka 'e nna' boto e e kgabetlelang merogo. Mo mofuteng ono wa motshameko, bana ba dirisa selo se sengwe go 'emela' kgotsa go supa se sengwe.



Setshwantsho 14 Lebokoso la khateboto le ka emela sejanaga, boloko ya lepolanka e ka emela apole mme matlapa a emela tšhelete.

Fa bana ba tshameka le go thala ba dirisa dilo le ditshwantsho go emela dilo tsa nnete. Seno ke tshimologo ya go ithuta gore matshwao a ka emela dilo tsa nnete. Ba ithuta:

- gore sethalo sa batho ba babedi se ka emela batho ba babedi ba nnete.
- gore matshwao a ka emela dilo tse dingwe, sk. '2' e emetse dilo tse pedi mme tseno e ka nna bobedi jwa sengwe le sengwe.

- 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

- ka ga dikakanyo tsa dilo tse di sa tshwaregeng le dikakanyo, sk. go gatisa ka boloko le go bua ka ga sebopego se se gatisitsweng go thusa bana go lemoga dipharologantsho tsa khutlonne.
- gore dilo di **amana** jang ka botsona, sk. ditshodi dingwe di a nyalelana, diboloko dingwe di ka tshegetsana, ditshamekisi tsa dikago di na le dikarolwana tse di nyalelanang mme e seng tsotlhe.

LENAANEFOKO

amana
gore dilo le dikakanyo di gokagana jang

Go na le ditirwana tse dingwe tse dintsi tsa metshameko tse di godisang boithutadipalo. Dingwe tsa dikao ke tse.

- Fa barutwana ba dirisa ditshodi tsa bogolo jo bo farologaneng, jaaka motlhaba le metsi go aga dikagophemelo tsa motlhaba, ba tlhotlhomisa mogopolo wa mothamo (feta/tlase), selekanyo (kgolo/nnye) le selekanyo (ntsi/mmalwanyana).
- Metshameko e e tshwanang le sekotšhe le go tlolatlola e rotloetsa bana go bala le go lemoga dipaterone.
- Bana ba ka tlhotlhomisa sebopego le bokaakang jwa dilo ka go di baya (jaaka mabokoso le dikgwele) mo kgetsanakgomông, go tlhopha selo se le sengwe le go se tlhalosa.

Ka go ikatisa ...

Rulaganya ditirwana tse di kgatlhang barutwana mme o ba dire gore ba fisegele dipalo.

- Rotloetsa motshameko wa keletso ka go simolola motshameko, sk. baya ditulo mo moleng go dira terena. Jaanong kopa morutwana go nna kwa pele jaaka mokgweetsi wa terena kgotsa mo setulong sa bobedi kana sa boraro jaaka mopalami. Ka tsela eno, barutwana ba ja monate mme gape ba ithuta megopolo e e tshwanang le maemo le tatelano ya dipalo.
- Tsena mme o refosanele ditirwana le barutwana fa ba ntse ba tshameka. Bontsha boitumelo jwa gago le go tsaya karolo ka go akanyetsa kwa godimo le go bua ka ga se se diragalang mo tirwaneng, sk. 'ke tladitse dikopi di le tharo ka metsi – nngwe, pedi, tharo. Jaanong ke tladitse e nngwe gape ka jalo, bona, di nne. Bona gore ba tlhomagane bontle jang!' Puisano ke tsela ya botlhokwa go ruta bana puo ya dipalo.
- Ela tlhoko gore barutwana ba bua jang ka dikakanyo tsa bona ka ga go bala, go kopanya le go abelana fa ba ntse ba tshameka, mme o boeletse diphitlhelelo tsa bona, sk. 'O badile dibaga di le tlhano tse dikhibidu mme wa bala dibaga di le tlhano tse ditala. A re baleng gore lo na le dibaga di le kae. E nepagetse dibaga di le lesome.'
- Thusa bana go akanya ka ga matshwao fa ba tshameka motshameko wa keletso. Tshikhinya gore selo sengwe se ka emela se sengwe jang, sk. 'O ka phetola tafole eo mme o e dirise jaaka mokoro wa gago.'

4. Molawana wa maemo

Tlhaloso

Dikgono le megopolo di a thusana. Seno se bidiwa **tswelelopele ya kgolo**. Barutwana ba agelela kitso ya bona mo go se ba setseng ba se itse le go se dira. Thuto e e siameng e ikaegile ka morutabana go batlisisa se barutwana ba setseng ba itse go se dira le se ba se tlhaloganyang, mme a dirise ditirwana le ditiragalo tsa letsatsi le letsatsi go agelela mo go tseo go ba thusa go ithuta kitso le dikgono tse dišwa.

LENAANEFOKO

tswelelopele ya kgolo
tatelano eo dikgono le megopolo di agelelang go tsona ka teng

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.

Morutwana mongwe le mongwe mo phaposiborutelong ya gago o nnile le maitemogelo a a farologaneng. Se se kaya gore botlhe ba mo mafelotshimologong a a farologaneng mo Mophato R. Kitso ya pele ya morutwana mongwe le mongwe ke pulamadibogo ya se o tlaa se ithutang. Barutwana ba ka dirisa se ba setseng ba se itse go ithuta megopolo le dikgono tse dišwa tsa dipalo.

Ka go ikatisa ...

- Rulaganya metshameko le ditirwana tse di maleba go ka lemoga kitso ya barutwana ya pele.
- Ela tlhoko se barutwana ba se dirang le go se bua fa ba tshameka le gore ba dira jang ditirwana tse di farologaneng.
- Rekota dithata tsa morutwana ka esi le ditlhokego tsa gagwe.
- Rulaganya ditirwana tse dišwa tse di agelelang mo kitsong ya morutwana mongwe le mongwe ya pele le go tlhaloganya ga jaana.

Go le gontsi ka ga molawana wa maemo

Phapologantsho

Barutwana mo phaposiborutelong ya Mophato R botlhe ba lekana ka bogolo, mme mongwe le mongwe wa bona o na le tshobotsi ya gagwe ka nosi, ditlhokego, bokgoni, dithata le dikgwetlho. Ba farologana ka:

- maitemogelo a kwa gae
- lemorago la ikonomiboago
- dikgatlhego
- ipaakanyetsothuto
- lemorago la setso
- maemo a puo
- kitso ya bona ya pele
- lebelo le ba tlhokang go ithuta ka lona
- tshegetso e ba e tlhokang mo barutabaneng le ba bangwe go ithuta.

Barutabana ba tlhoka go tswelela go ela tlhoko le go rekota tswelelopele ya morutwana mongwe le mongwe mmogo le kgolo mo dipalong. Phapologantsho e kaya gore se o se rutang le tsela e o se rutang ka yona o tlhoka go ela tlhoko bokgoni jo bo farologaneng jwa barutwana ba gago kgotsa maemo a kgolo ya bona.

Go dirisa tsela eno, barutabana ba tlhoka go ela morutwana mongwe le mongwe tlhoko ka nako ya ditirwana le go lemoga se ba se tlhaloganyang le se ba kgonang go se dira ka katlego, mme ba dirise tshedimosetso eno go rulaganyetsa barutwana ditirwana le tshegetso. Barutwana bangwe ba ka tlhaloganya kakanyo e ntšhwa e e tlhagisiwang mo tirwaneng, ka tshegetso e nnye fela go tswa mo morutabaneng. Barutwana ba bangwe ba ka tlhoka nako e ntsi, ditshupetso, dikao tse dintsi le tshegetso e kgolo go tswa mo morutabaneng go fitlhelela maemo a a tshwanang a go tlhaloganya.

Tsaya sekao sa barutwana ba ba ithutang setlhogo se se tshwanang mo phaposiborutelong ya Mophato R – maemo mo sebakeng (mo/tlase ga, fa pele ga/kwa morago).

- Barutwana bangwe ba tlaa tlhaloganya pharologano magareng ga maemo ano mo nakong e khutshwane le tlhaloso go tswa mo morutabaneng. Mo nakong e khutshwane ba tlaa bo ba ipaakanyeditse go fetela mo mogopolong o o latelang, maemo mo sebakeng a a fitlhelwang mo ditshwantshong.

- 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'.

- Barutwana ba bangwe ba ka tlhoka nako e ntsi le tlhaloso go tswa mo morutabaneng fa ba dira ditirwana. Le bona ba tlaa fetela kwa mogopolong o o latelang fela go tlaa ba tsaya nako e telejana mme ba tlaa tlhoka tshegetso e ntsi.

Ka go ikatisa ...

O ka dirisa phapologantsho fa o ruta ka go:

- ela tlhoko dintlhatshwano le dipharologano tsa barutwana ba gago
- rulaganya tsela e e siameng thata go ruta morutwana mongwe le mongwe go ya ka dithata tsa gagwe
- fetola se se rutiwang gore se ele tlhoko bokgoni, **temosi ya bokgoni jwa go tlhaloganya**, kitso ya pele, dikgatlhego le lemorago la ditso tsa barutwana botlhe
- lepanya, mo go tlhokegang, se o solofelang gore morutwana mongwe le mongwe a bo a se rutilwe morago ga tirwana
- akanya ka ga maitshwaro a barutwana mmogo le bokgoni jwa bona fa o swetsa gore o ba aroganya jang ka ditlhopha gore ba tle ba thusane go rutega le go tshegetsana
- dirisa ditirwana le didiriswa tse di maleba
- ruta barutwana ba ba farologaneng ka dinako tse di farologaneng, sk. barutwana ba bangwe ba ka tlhoka nako e e fetang ya ba bangwe go fetsa ditirwana kgotsa go araba dipotso
- dira ditirwana tsa ditlhopha tse dinnye gore o kgone go tota barutwana ka nosi le go ba tlamela ka tshegetso e e maleba fa ba e tlhoka
- rulaganyetsa barutwana ba ba tlhokang ditirwana tse di gwetlhang.

LENAANEFOKO

temosi ya bokgoni jwa go tlhaloganya
ka go dirisa ditemosi tsa gago go kgobokanya tshedimosetso ka ga tikologo ya gago, sekao: go bona, go utlwa, go kgoma, go nkgelela le go latswa

5. Molawana wa tirisano

Tlhaloso

Go ithuta go akaretsa tlhaeletsano le kabelano ya dikakanyo. Barutwana ba tshwanetse go rotloediwa go bua le morutabana le go buisana ka bobona mabapi le se ba se akanyang le se ba se dirang. Kabelano ya dikakanyo, go botsa dipotso le go tlhalosa se ba se dirang go ba thusa go godisa go tlhaloganya megopolo ga bona. Gape go ba thusa go ithuta go dirisa puo ya dipalo ka go itshepa.

Ka go ikatisa ...

- Maemo a mo phaposibotuleng a tshwanetse go repisiwa gore barutwana ba lokologe go botsa dipotso le go abelana dikakanyo fa ba ntse ba rarabolola dipalo.
- Barutwana ba bannye ba tlhoka go rutiwa go dirisa mafoko a dipalo ka nepo gore ba a dirise go tlhagisa dikakanyo tsa bona le go akanya, sk. go ithuta go tlhalosa fa kgwele e le 'kgolokwe' go na le gore ba re ke 'sediko'.

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.

Barutwana ba rata go re, '*nnye thata*'. Tiisa puo ya dipalo ka go boeletsa se morutwana o se buileng, mme dirisa '*khutshwane thata*' mo boemong.

Setshwantsho 15 Barutabana ba ka kaela bana go dirisa puo ya dipalo.

Go le gontsi ka molawana wa tirisano

Tlhaeletsano: Go reetsa le go bua ka matlhagatlhaga

Re rutega sentle fa re dira sengwe le go bua le mongwe, ka bobedi kgotsa ka ditlhopha. Barutwana ba tlhoka go godisa dikgono tsa go tlhaeletsana mme gape ba tlhoka go itse gore o ka nna karolo ya puisano jang. Ba tshwanetse go ithuta go reetsa ka matlhagatlhaga se se buiwang ke yo mongwe le go tsiboga ka tshwanelo. Se se kaya gore ba tlhoka go kgona go ka:

- reetsa se se buiwang
- tsiboga ka tsela e e maleba
- refosana ka go bua le go reetsa.

Ka go ikatisa ...

Thusa barutwana go godisa dikgono tse di siameng tsa go reetsa le go bua ka go ba neela ditšhono tsa go:

- tsena mo motlotlong kgota mo puisanong
- reetsa sentle ka tlhomamo
- abelana kgotsa go tlhagisa dikakanyo le megopolo ya bona
- tsiboga le go neelana ka dipoelo
- botsa dipotso
- latela ditaelo.

Fa barutabana ba reetsa barutwana ka matlhagatlhaga, barutwana:

- ba rotloetsega go abelana ka dikakanyo tsa bona, dipotso le megopolo
- ba lokologa gore morutabana o a ba kgatlhegela le gore o kgathalela go itse gore a ba a tlhaloganya
- ba godisa dikgono tsa bona tsa go reetsa ka matlhagatlhaga.

Go tsibogela sengwe ka tsela e e maleba ke karolo e e botlhokwa ya tlhaleletsano, go rutiwa le go ithuta. Fa barutwana ba amogela tsibogo e e siameng ya dipotso kana dikakanyo tsa bona, ba dumela gore dikakanyo tsa bona di botlhokwa le gore di na le boleng. Se e nna sekai mo go bona tebang le tsibogo e e maleba.

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.

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.

GLOSSARY

abstract
an idea, a thought or a feeling

exact
precise, accurate

Figure 16 Maths language is exact.

Ka go ikatisa ...

O ka tsiboga ka tsela e e maleba go barutwana ba gago ka go:

- sa letle gore ba ikutlwe e kete ba boditse potso ya bomatla
- boeletsa potso e ba e boditseng ka dinako dingwe gore ba itse gore ba a reediwa
- ba rotloetsa go botsa dipotso tse di utlwalang ka go botsa potso e ba e boditseng ka mokgwa mongwe kgotsa go ba kopa go e boeletsa ka mokgwa o mongwe
- leka go araba dipotso tsa bona ka ditsela tse di tlhabosang mo go bona, sk. ka go simolola ka se ba setseng ba se itse kgotsa/le go dirisa dikao go tswa mo maitemogelong a bona.

Seabe sa puo mo dipalong

Rotlhe re dirisa puo go tlhaeletsana. Re e dirisa go abelana dikakanyo le tshedimosetso mmogo le go tlhalosa dikakanyo tse di **sa bonaleng**. Puo gape e botlhokwa mo dipalong. Re e tlhoka go tlhalosa, go thaloganya, go botsa, go akanya, go neelana ka mabaka, go tlhalosa le go tlhagisa megopolo ya dipalo.

LENAANEFOKO

go sa bonale
kakanyo, mogopolo
kgotsa maikutlo

tshwana
ka bokhutshwane,
ka nepo

Puo ya dipalo e akaretsa mafoko le matshwao a re a dirisang go tlhaeletsana kgotsa go abelana dikakanyo kgotsa megopolo. Nakonngwe re dirisa puo ya letsatsi le letsatsi, mme puo ya dipalo e a **tshwana** le go nna maleba. O ka buisa go le gontsi ka ga kitso ya letsatsi le letsatsi le ka ga kitso ya sekolo mo ditsebeng 16–23. Dikao tse tharo tsa seno ke tse.

- Mo puong ya letsatsi le letsatsi lefoko 'seripa' le ka dirisiwa go tlhalosa sengwe se se ka aroganngwang ka dikarolo tse pedi tse di lekanang. Le fa go ntse jalo, mo dipalong, 'seripa' se kaya dikarolo tse pedi tsa selo se se botlalo se arogantswe ka go lekana. Dikarolo tse pedi di lekana po, ka bogolo kgotsa palo.
- Ka puo ya letsatsi le letsatsi re ka re, 'Morutabana o mogolo'. Le fa go ntse jalo, mo dipalong re tlaa re 'Morutabana o moleele', re bo re lekanya bogodimo jwa gagwe, re bala 'nngwe', 'pedi', 'tharo', jalo jalo fa re ntse re lekanya.
- Mo puong ya letsatsi le letsatsi, re ka re khutlotharo ke sebopego se se motsu. Le fa go ntse jalo, mo dipalong re tlaa re khutlotharo e na le matlhakore a mararo a a tlhamaletseng le dikhutlo tse tharo.

Setshwantsho 16 Puo ya dipalo e a tshwana.

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.

Go godisa puo ya bana ya dipalo

Karolo ya go ithuta megopolo e meswa e akaretsa go ithuta puo e ntshwa. Barutabana ba tlhoka go kaela barutwana fa ba ntse ba simolola go tlhaloganya le go dirisa puo e ntshwa ya dipalo ka iketlo kwa sekolong le letsatsi le letsatsi mo matshelong a bona. Ba tlhoka go lemotsha barutwana ba Mophato R tlotlofoko e e nepagetseng ya dipalo go ba kgontsha go sala ditaelo morago, go botsa dipotso le go tlhagisa dikakanyo tsa bona le go neelana ka mabaka. Barutwana ba iponela puo e ntshwa le dipalo ka nako e le nngwe. Fa ba ntse ba ithuta mafoko a maswa, ba ithuta megopolo e mengwe, ka go dira jalo ba ithuta mafoko a mangwe le megopolo e mengwe, ka jalo ba atlega thata mo ditirong tsa bona tsa dipalo.

Ka go ikatisa ...

Morutwana yo o itseng bokao jwa mafoko 'kgolokwe' le 'sephaphathi' o ka tlhalosa dipharologantshopalo tsa dilo. Sekao, ka motshameko wa bona ba lemoga gore dilo tse dikgolokwe di a dikologa le gore dilo tse di sephaphathi di a relela. Barutwana ba ba sa itseng mareo 'kgolokwe' kgotsa 'sephaphathi' ba ka tsaya ditshwetso tse di sa felelang fela ka ga dilo tse ba di tlhotlhomisang – mabokoso a a relela fela dikgwele di a dikologa. Barutwana bano ba tlhoka go rotloediwa go ithuta puo e ntshwa e e maleba go atolosa go tlhaloganya kitso ya bona le megopolo.

Setshwantsho 17 Go godisa puo ya dipalo ka go tshameka

Rotloetsa barutwana go dirisa puogae ya bona thata fela mo go kgonagalang. Seno se thusa go godisa bokgonikakaretso jwa bona jwa puo le dikgono tsa go akanya. Mo Aforikaborwa ('Aforika Borwa'), barutwana ba bantsi ba Mophato R ba ithuta ka go dirisa puo ya bona ya bobedi kgotsa ya boraro. Go ruta dipalo go ka thusa go godisa bokgoni jwa bona go dirisa dipuo tseno fa e le gore ba newa ditshono go bua ka ga se ba se dirang ka nako ya ditirwana tsa dipalo, go abelana dikakanyo tsa bona le go buisanela peo ya bona ya mabaka.

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)

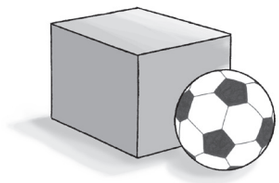


Figure 20

- shape (round, square)

Figure 21

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

Figure 22

- size (big, small)

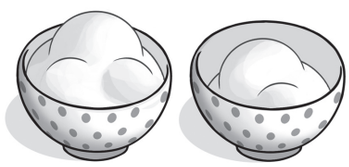


Figure 23

- 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.

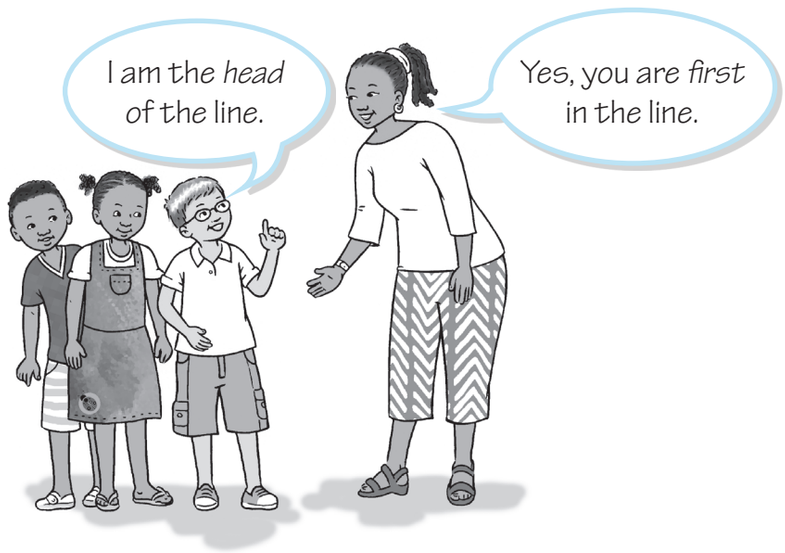


Figure 24 Encourage learners to use maths vocabulary.

Go ithuta tlotlofoko e e nepagetseng ya dipalo

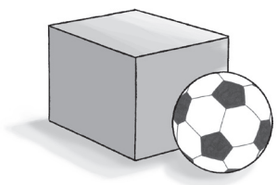
Barutwana ba tlhoka tlotlofoko go bua le go akanya ka ga megopolo ya dipalo. Sekao, ba tlhoka go itse mafoko a a tshwanang le a go tlhalosa:

Setshwantsho 18

- selekanyo (bontsi, go feta, ntsi, mmalwanyana)

Setshwantsho 19

- palelo (tlhakanya, ntsha)

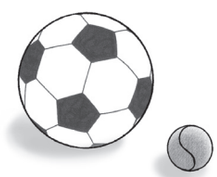


Setshwantsho 20

- sebopego (kgolokwe, khutlonne)

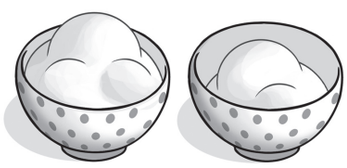
Setshwantsho 21

- maemo (ntlha, bobedi, boraro, bofelo, pele, morago, magareng)



Setshwantsho 22

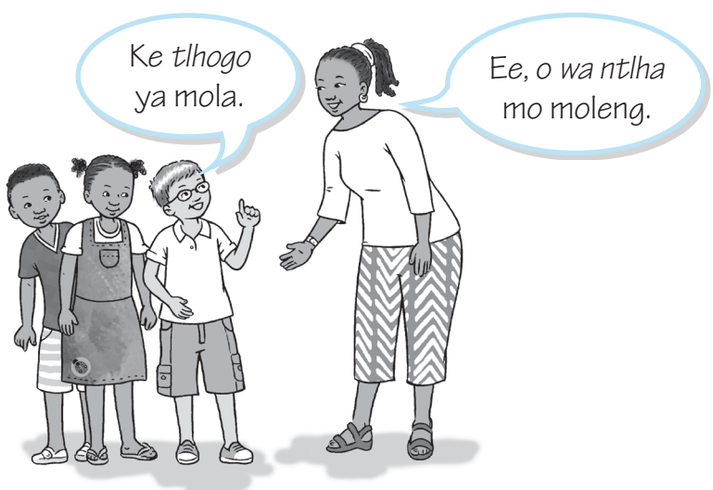
- bogolo (kgolo, nnye)



Setshwantsho 23

- tekanyo (feta, tlase, leele, bophara, tletse, bokete, leele, khutshwane, moso, bosigo)

Rotloetsa barutwana go dirisa tlotlofoko ya dipalo ka go e dirisa fa o bua le bona ka ga megopolo ya dipalo, le go bua se ba se buang ka tsela e nngwe o dirisa puo ya dipalo. Kwa bofelong jwa Karolo ya Diteng e nngwe le e nngwe mo Karolong 3 go na le lenaane le le tletseng la tlotlofoko ya dipalo le le maleba le Karolo ya Diteng.



Setshwantsho 24 Rotloetsa barutwana go dirisa tlotlofoko ya dipalo.

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.

Dipalo di lebeletse kamano magareng ga dilo. Barutwana ba tlhoka puo go akanya le go bua ka ga dikamano tseno, go akaretsa:

- papiso magareng ga kgobokanyo ya dilo (ntsi, mmalwa, feta, mmalwanyana)
- papiso ya bogolo le selekanyo (kgolo/nnye, leelenyana/khutshwanyane, boketekete/bofefofefo)
- papiso ya sebopego (matlhakore a mararo, matlhakore a mane, kgolokwe kgotsa kgogoropo)
- maemo mo sebakeng (fa pele ga, morago, tlase, gaufi le, magareng)
- tatelano ya dilo (ntlha, bofelo, bobedi, latela, pele ga, morago ga, magareng)
- papiso magareng ga bokaakang jwa sengwe (feta, nnye, tshwana).

Go tlhaloganya le go dirisa matshwao

Matshwao a re dikologile otlhe. Matshwao a barutwana ba a bonang mo tikologong ya bona ya letsatsi le letsatsi go le gantsi a na le mafoko le matshwao. Barutwana ba ithuta gore mafoko ano le matshwao a na le bokao. Sekao, matshwao a go bontsha gore o ka kgabaganya tsela leng kgotsa gore sengwe se ja bokae.

2

Setshwantsho 25 Letshwaokemo le nomore '2' tsotlhe ke matshwao.

Bana ba bannye ba lekeletsa ka matshwao a a kwadilweng ka dithalo le maiteko a pele a go kwala. Mo Mophato R, go tlhaloganya puo ya dipalo go aga motheo go ka dirisa matshwao a dipalo ka nepo.

Go baya mabaka le go bonela pele

Barutwana le bona ba tlhoka puo go:

- reetsa le go tshwaela mo **go bayeng mabaka** ga mongwe
- tlhalosa kakanyo ya bona le go e dirisa go **bonela pele** se se tlaa diragalang. Ba tlhoka puo go tlhalosa paterone le go bua gore go ya go latelang fa paterone e tsweletswa.

LENAANEFOKO

go baya mabaka
kakanyo e e latelang mogopolo kgotsa polelo

bonela pele
go bua kgotsa go fopholetsa gore go tlaa diragalang mo isagong

Setshwantsho 26 Bonela pele gore go latela sebopego sefe mo tatelanong.

Ka go ikatisa ...

Go rotloetsa kgolo ya puo ya dipalo, barutwana ba tlhoka ditšhono di le dintsi go:

- tshameka
- nna le go tlhaeletsana le bagolo le bana ba bangwe
- bua ka ga dikakanyo tsa bona le peo ya bona ya mabaka.

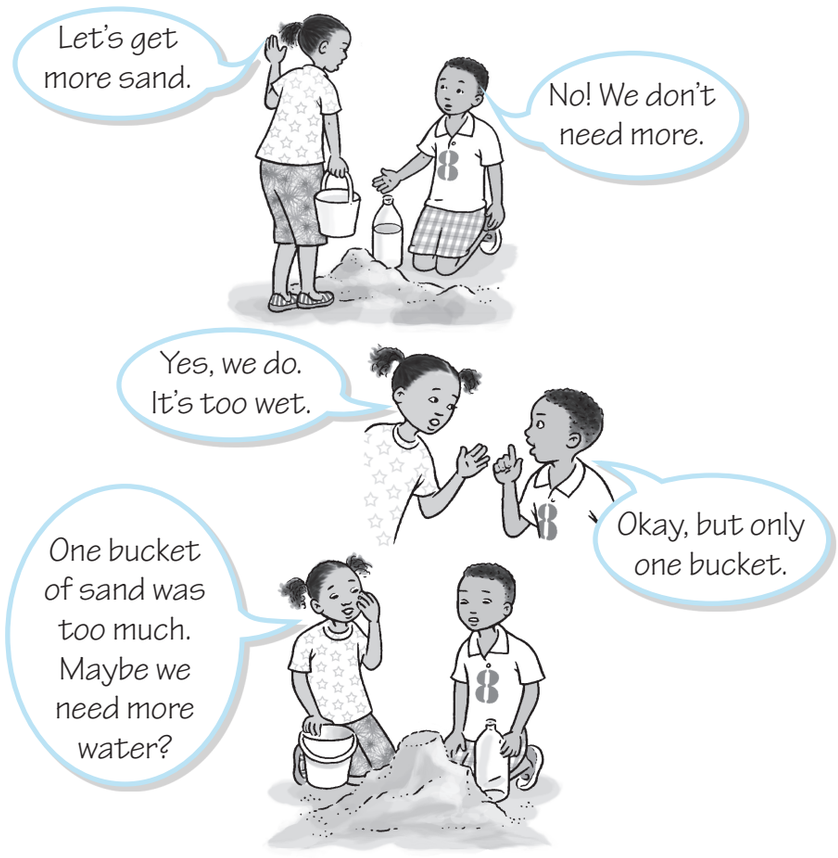


Figure 27 Play is an opportunity to use maths language.

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

Setshwantsho 27 Motshameko ke tšhono ya go dirisa puo ya dipalo.

Ela tlhoko gore barutwana ba dirisa puo ya dipalo jang fa ba:

- bua ka ga se ba se dirang
- tlhalosa maitemogelo a bona fa ba se mo sekolong, sk. fa ba baakanyetsa dilalelo, fa ba tshameka kgotsa ba tlhalosa gore ba ile jang sekolong go tswa kwa gae
- dira mafoko fa ba sa itse puo ya sengwe e e nepagetseng ya dipalo, sk. ba tlhalosa sekhutlo jaaka 'ntlha e e bogale' kgotsa ba taya 'lesomenngwe' jaaka 'bolesomenngwe'
- bonela pele se se tlaa diragalang, sk. 'Tora e tlaa wa fa ke baya diboloko tse dingwe mo godimo.'

6. Molawana wa go kaelwa

Tlhaloso

Barutabana ba kaela barutwana go tlhaloganya kitso e ntšhwa. Ba rulaganya maemo a go ruta le go ithuta go bakela barutwana ditšhono go tota ditiro le didiriswa gore barutwana ba tlhotlhomise kakanyo le go abelana megopolo ya bona ka ga tharabololo ya dipalo. Barutabana ba dira dikai tsa gore ba ka dirang le go botsa dipotso tse di kaelang go thusa barutwana go rarabolola dipalo. Ka dinako tse dingwe seno se bidiwa **botsereganyi**. Ka botsereganyi, barutwana ba nna le kitso e ntšhwa mmogo le maitsholo le ditogamaano tsa go rarabolola dipalo tse ba ka di dirisang mo bokaelong jo bongwe.

LENAANEFOKO

botsereganyi
tirwana ya motlhakanelwa moo motho yo o itseng go le gontsi kgotsa a na le dikgono tse di kwa godimo o kaelang ba bangwe go ithuta sengwe se sešwa

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.

Ka go ikatisa ...

O ka dirisa jang botsereganyi mo phaposiborutelong

1. Ela tlhoko gore ke megopolo le dikgono dife tse barutwana ba setseng ba di itse mme o rulaganye tirwana e e maleba.
2. Neela barutwana tirwana e e totileng mopololo le kgono e ntšhwa.
3. Dira sekai sa tirwana kgotsa bontsha barutwana gore e dirwa jang.
4. Neela barutwana dipoelo tsa gore ba dira jang.
5. Neela dikumako kgotsa metlhala go thusa barutwana, mme o se ba neele dikarabo.
6. Thusa barutwana ka go ba botsa dipotso mabapi le se ba se dirang.
7. Rotloetsa barutwana go botsa dipotso gore ba itirele dikgokagano tse dišwa le dithibololo.
8. Neela barutwana tirwana e nngwe gore ba e dire ka boikemedi, ka go dirisa ka go dirisa mogopolo kgotsa kgono e ba e ithutileng. Mo tirwaneng eno, ba itlwaetse go diragatsa kgono e ntšhwa kgotsa kitso ka ditsela tse di farologaneng. Ba kaele le go ba tshegetsa mme o sa tseye karolo mo go kalo.
9. Oketsa ditirwana tsa barutwana ka go ba neela tse dingwe mme o gogele kaelo le tshegetso ya gago morago ka iketlo, ka go dira jalo o ba letla go itirela dilo ka bobona.

Go le gontsi ka ga molawana wa go kaela

Ditsela tsa go ruta

Go ruta go akaretsa tiriso ya ditsela tse di farologaneng mo dinakong tse di farologaneng:

- Taelo ka tlhamalalo e akaretsa puisano e nnye thata. Barutwana ba ka botsa dipotso, fela seno ke ka ga go latela ditaelo thata. Taelo ka tlhamalalo e tshwanetse ya nna karolo e nnye thata ya go ruta.
- Taelo e e nang le kaelo e akaretsa go dira mmogo ga barutabana le barutwana go rarabolola dipalo kgotsa go ithuta mogopolo kana kgono e ntšhwa. Morutabana o neelana ka kaelo le tshegetso go fitlhelela barutwana ba kgona go dira tirwana ka bobona. Mo *Grade R Maths* seno se bidiwa tirwana ka kaelo ya morutabana.

Ditirwana tse di nang le sebopego

- Ditirwana tse di nang le sebopego ke ditirwana tsa go ruta le go ithuta tseo go le gantsi di kaelwang ke morutabana. Di tota mogopolo kana kgono e e rileng ya dipalo.
- Mo lenaneong la *Grade R Maths*, ditirwana tse di nang le sebopego di arogantswe ka:
  - ditirwana tsa phaposiborutelo yotlhe
  - ditirwana tse di kaelwang ke morutabana tsa setlhopha se sennye
  - ditirwana tsa boikemedi tsa setlhopha se sennye
  - ditirwana tsa go itlhophela ka tokologo.

Go botsa dipotso

Dithekeniki tse di siameng tsa go botsa dipotso di botlhokwa mo thutong. *Grade R Maths* e rotloetsa barutabana go dirisa dipotso tse di bulegileng tse di fetlhang go akanya sedipalo. Mofuta ono wa dipotso o fitlhelwa mo ditiropalong le mo ditlhotlhomising. Dipotso tse di bulegileng gape di thusa barutabana go kgobokanya tshedimosetso ka ga maemo a barutwana a go tlhaloganya le kitso.

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.

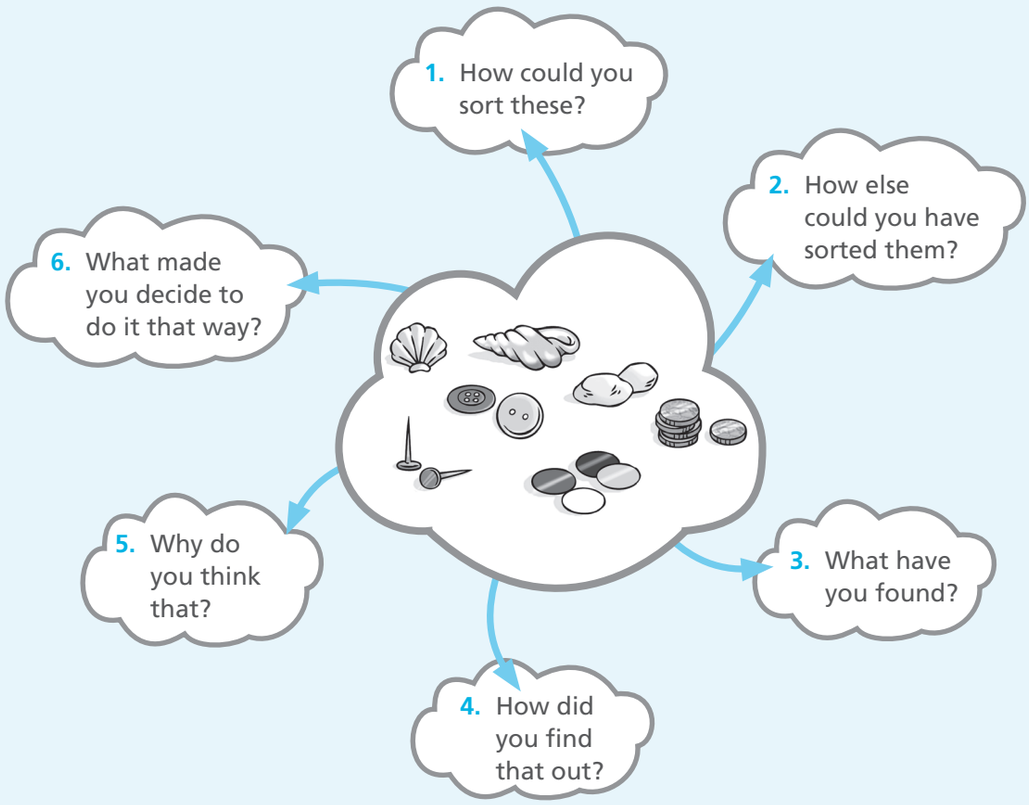


Figure 28 Open-ended questions

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.

Dipotso tse di tswalegileng (Dipotso tsa maemo a a kwa tlase)	Dipotso tse di bulegileng (Dipotso tsa maemo a a kwa godingwana)
Dipotso tse di nang le tsibogo e e lekanyeditsweng ka 'ee'/'nnyaa'.	Dipotso tse di nang le bokgoni jwa go arabiwa ka dikarabo tse di fetang nngwe.
Sekao: A seno ke khutlotharo? Sekao: A seno ke khutlotharo kgotsa khutlonne?	Sekao: O ka mpolelela eng ka ga dikhutlotharo? Sekao: Khutlotharo e farologana jang le khutlonne?

Ka go ikatisa ...

- Botsa dipotso tse di bulegileng tseo di neelang barutwana ditšhono go akanya ka boikemedi le go tlhaeletsana ka ga dikakanyo tsa bona. Tila go dirisa dipotso tse dikhutshwane tse di totileng fela kgakologelo ya dintlha, kgotsa tse di nang fela le dikarabo tsa 'ee'/'nnyaa'.
- Neela barutwana nakonyana ya go leka go araba potso gore ba tle ba akanye, ba rulaganye dikakanyo tsa bona le go di tlhalosa ka mafoko.

Setshwantsho 28 Dipotso tse di bulegileng

Tharabololo ya dipalo

Barutwana ba kopana le dipalo tse ba sa kgoneng go di rarabolola ka gangwe. Barutabana ba Mophato R ba tshwanetse go tshegetsa barutwana go godisa dikgono tsa go lepalepana le dipalo tseno ka go ikemela. Seno se akaretsa nako e e lekaneng go bua ka ga palo, go lekeletsa dikakanyo, go ithuta ka go dira diphoso, go tshameka ka palo le go dirisa dikakanyo ba ikaegile ka ditlhotlhomisi.

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.

Ka go ikatisa ...

- Barutwana ba bua go gaisa.
- Barutwana ba rotloediwa go lekeletsa dikakanyo le go dira diphoso.
- Barutwana ba abelana dikakanyo le morutabana mmogo le barutwana ba bangwe.
- Barutabana ba reetsa dikakanyo tsa barutwana.
- Ka kakaretso dipotso tsa barutabana ke tse di bulegileng le go kaela go akanya ga barutwana.

7. Molawana wa kakaretso

Tlhaloso

Go tlotla **methalethale** le kakaretso ke ditshwanelo tsa bana. Di botlhokwa fa re batla gore bana botlhe ba ithute le go gola mo bokgoning jotlhe jwa bona. Barutabana ba tlhoka go ela tlhoko boitlhaolo, ditlhokego le dikgatlhego tsa ngwana.

Phaposiborutelo nngwe le nngwe ya Aforikaborwa ke ya methalethale. Go na le barutwana ba bantsi ba ba farologaneng mme mongwe le mongwe wa bona o tlisa boitlhaolo jwa gagwe, maitshwaro, bokgoni, dikgatlhego le lemorago. **Boakaretsi** ke tiragatso ya go netefatsa gore bana botlhe, go sa kgathalasege ke ba methalethale, ba a akarediwa mo ditirwaneng tsa phaposiborutelo, segolobogolo barutwana ba ba ka ikgatholosiwang kgotsa go kgapelwa thoko. Bogole ke *nngwe* ya mabaka a gore goreng bana go le gantsi ba kgaphelwa thoko, mme se se botlhokwa, dilo tsa loago, maikutlo, tshobotsi le maitshwaro le tsona di tlisa dikgoreletsi mo go ithuteng. Barutabana ba ba nang le boakaretsi mo megopolong ya bona, ba amogela bomethalethale jwa barutwana ba bona.

Thutotsenyeletso e kaya gore bana botlhe ba tsena sekolo ba le mo dingwageng tse di maleba mo diphaposiboruteleng. Ba a amogelwa, ba rotloediwa go nna le seabe mo mererong yotlhe ya sekolo mme ba tshegediwa go ithuta le go fitlhelela bokgoni jotlhe jwa bona.

LENAANEFOKO

methalethale
mefuta ya batho ka dipharologano tsa bona, sekao, itshupo, botho, bokgoni, tse ba di ratang le lemorago la bona

boakaretsi
tiragatso ya go netefatsa gore bana botlhe, go sa kgathalesege dipharologano tsa bona, ba akarediwa mo ditirwaneng tsotlhe tsa phaposiborutelo

Ka go ikatisa ...

- Barutwana botlhe ba na le tshwanelo ya go tsewa e le ba ba kgethegileng, go nna le seabe le go akarediwa mo ditirwaneng le mo dipuisanong tsa mo phaposiborutelong. Seno se akaretsa bana ba ba nang le bogole, mathata a maitshwaro kgotsa dikgoreletsathuto tse dingwe.
- Barutwana botlhe, batsadi ba bona le badiri ba sekolo ba tshwanetse go amogelwa, go akarediwa, go tsholwa sentle le go tlotliwa go sa kgathalasege gore ke ba setso, morafe, lotso, bong, tlhaolobong, tlwaetsobong, bokgoni jwa mmele kana tlhaloganyo, tumelo kgotsa maemo a loagoikonomi afe.

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.

Go le gontsi ka ga molawana wa go akaretsa

Ditsela tse di farologaneng tsa go ithuta

Methalethale ga se fela ka ga dipharologantsho tsa rona tsa mmele, ditumedi, kgotsa tumelo, gape e ka akaretsa gore re ithuta jang dikgono tse diswa. Ga se bana botlhe ba ba ithutang ka tsela e le nngwe. Go na le ditsela tsa methalethale tsa go ithuta tse di maleba go moithuti mongwe le mongwe. Sekao, ga se barutwana botlhe ba kgonang go sala ditaelo tsa morutabana ka go reetsa fela se a se buang. Barutwana ba bangwe ba ka ikungwela botoka fa ba lebeletse setshwantsho se se tlhagisang se ba tshwanetseng go se dira. Ba bangwe ba ka tlhoka tiragalo kgotsa tirwana ya botsayakarolo gore ba tlhaloganye taelo kana mogopolo ka botlalo.

Ka go ikatisa ...

Barutabana ba ba atlegileng ba kgona go lemoga ditlhokego tsa morutwana mongwe le mongwe tsa go ithuta mo phaposiborutelong ya bona le go dira gore ditirwana e nne tse di tsamaelanang le ditlhokego tsa morutwana mongwe le mongwe. Ditsela tse di latelang tse robedi tsa go ithuta di maleba go ruta le go ithuta mo Mophato R:

- Go ithuta ka pono (Manno): Go akaretsa tiriso ya ditshwantsho kgotsa dithalo go gopola tshedimosetso. Barutwana ba bangwe ba tlhaloganya le go gopola tshedimosetso bonolo fa e tlhagisitswe e le ditshwantsho kgotsa dithalo.
- Go ithuta ka go utlwa (Utlwa mmino): Go ikaegile ka go reetsa tshedimosetso go tlhaloganya ka botlalo le go e gopola. Barutwana bangwe ba ithuta sentle fa ba ka reetsa morutabana, kgotsa pina kana rekoto.
- Ka go bua (Bopuo): Go ithuta ka go bua go akaretsa go bua le go tlhagisa dikakanyo ka go bua, le go rala kana go kwala gore o tlhaloganye ka botlalo le go gopola tshedimosetso.
- Go ithuta ka go dira (Tsamaisomesifa): Go ithuta ka go dira go diragala fa morutwana a dira tirwana ya go tsaya karolo. Barutwana bano ba dirisamebele ya bona le temosi ya kgomô (go tshwara) go tlhaloganya tshedimosetso.
- Go ithuta ka peomabaka (Bodipalo): Go ithuta ka peomabaka go akaretsa tiriso ya tlhomaganyomabaka le go ntsha mabaka go dira gore tshedimosetso e nne le bokao. Barutwana ba tlhomaganyo ya mabaka ba tlaa dirisa tlhomaganyomabaka le go batla mabaka fa ba ithuta dilo tse diswa.
- Go ithuta ka loago (Dikamano): Go ithuta ka loago go akaretsa go ithuta le ba bangwe. Barutwana ba bangwe ba rata go ithuta ba le karolo ya setlhopha kgotsa le tsala.
- Go ithuta ka bonosi (Bowena): Go ithuta ka bonosi go akaretsa go ithuta ka bowena. Barutwana ba bangwe ba tsepama sentle fa ba reetsa dikakanyo tsa bona le maikutlo ka bobona, kwa ntle ga go re ba kgorelediwe ke ba bangwe.
- Go ithuta ka tlhago (Tlholego): Go ithuta ka tlhago go diragala ka tlholego. Barutwana ba bangwe ba rutega le go tlhaloganya sentle fa ba batlisisa le go tlhotlhomisatlhago ka maitemogelo a kwa ntle, jaaka go ela diphologolo tlhoko, go dira tshingwana, go tlhokomela tlhago kgotsa go batlisisa tikologo.

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.

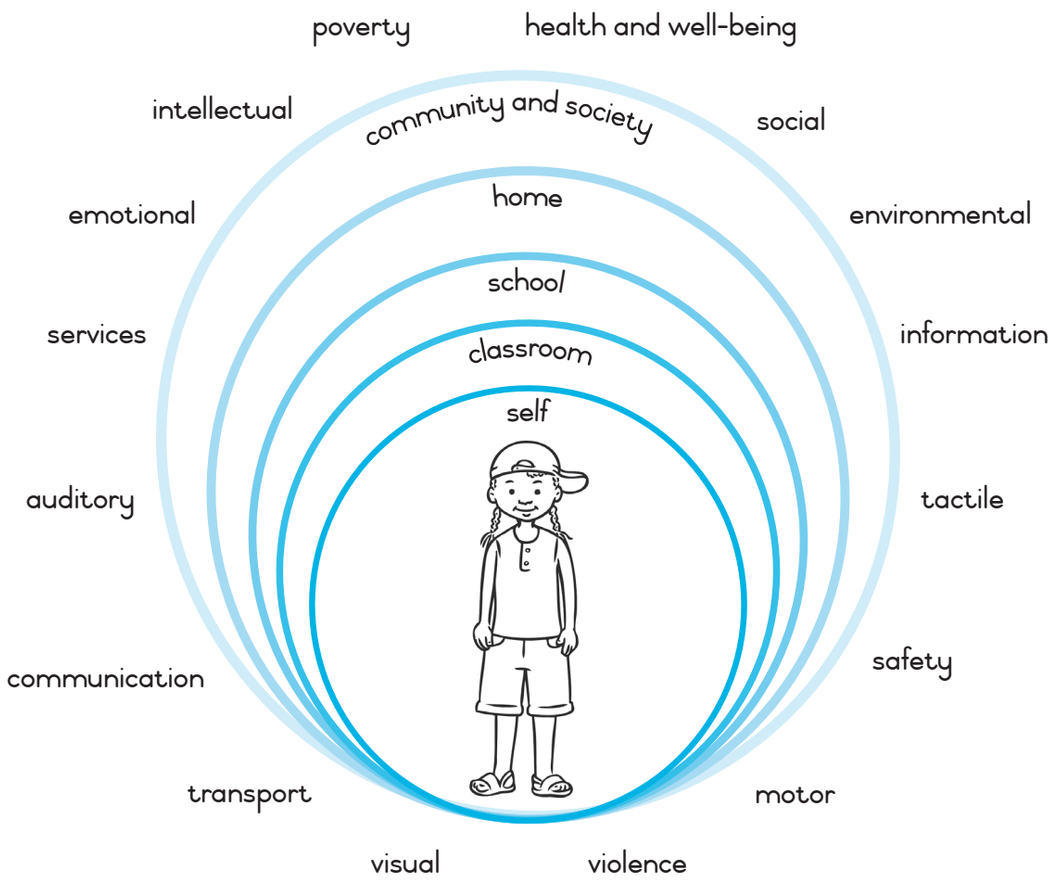


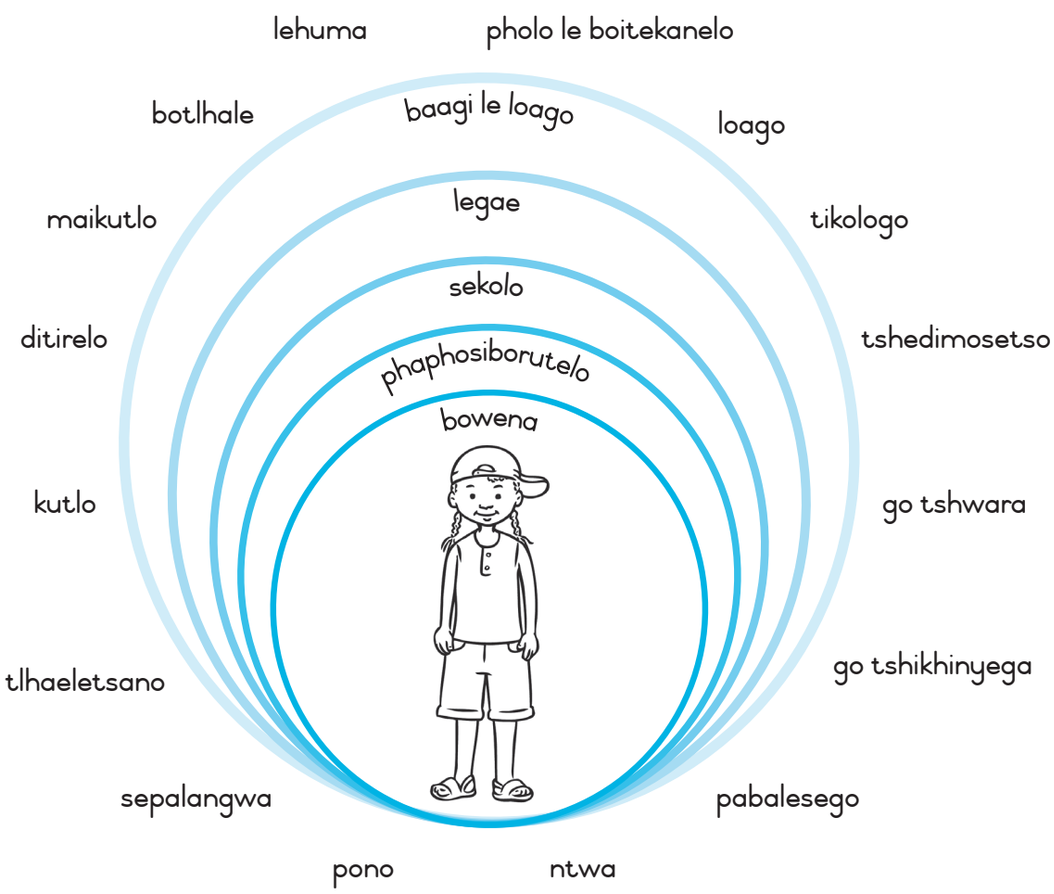
Figure 29 Barriers to learning

Dikgoreletsi tsa go ithuta dipalo

Sekgoreletsathuto ke sengwe le sengwe se se kganelang ngwana go ithuta sentle. Dikgoreletsi di ka golaganngwa le ngwana (ka boena) ka tlhamalalo, sekao, go golafala ga tlhaloganyo, kutlobotlhoko kgotsa letsogo le le robegileng. Dikgoreletsi gape di ka nna tse di sa tleng le ngwana (tsa kwa ntle), sekao, lehuma, ikgathololo kgotsa phaposiborutelo e e tletseng phetelela.

Puo ke sediriswa sa botlhokwa sa go ithuta. Mo Aforikaborwa seno go le gantsi se itlhagisa e le sekgoreletsi sa ka fa teng le sa kwa ntle mo go ithuteng, segolobogolo moo puogae ya ngwana e farologanang le puo e e dirisiwang go ruta le go ithuta.

Bana ba le bantsi ba itemogela sekgoreletsi sa go ithuta se le sengwe kgotsa go feta. Ba ka tlhoka ikatiso e ntsi le tshegetso go na le bana ba bangwe. Dikgoreletsathuto ke dilo tse di dirang gore go nne thata mo baneng ba bangwe go ithuta dipalo. Dikao tsa dikgoreletsi di tlhagisitswe mo sethalong se se latelang.



Setshwantsho 29 Dikgoreletsathuto

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.

Ka go ikatisa ...

Dingwe tsa ditsela tseo ka tsona o ka akaretsang barutwana botlhe mo phaposiborutelong ya gago ya Mophato R di akaretsa tse di latelang:

- Rulaganya dithuto tsa gago, ditirwana le didiriswa gore di nne maleba le ditlhokego tsa barutwana ba ba farologaneng, sk. palo e e ikaegileng ka setshwantsho e ka tlhoka gore e nne le tlhaloso go thusa morutwana go tota dikarolo tsa botlhokwa tsa setshwantsho.
- Dirisa ditirwana tse dintsi tsa tiragatso ka dilo tsa nnete.
- Naya barutwana nako e e lekaneng le tshegetso go fetsa ditirwana, go akanya le/kgotsa go araba dipotso, fa ba e tlhoka.
- Go ka thusa go buisana le modirammogo kana setlhophatshegetso sa sekolo, ka ga maemo a a dirang ka ona le morutwana go netefatsa gore o mo tlamela ka tshegetso e e seng kana ka sepe. Gape o ka tswa o tlhoka go ikopantsha le batsadi kana batlhokomedi ba ngwana mmogo le setlhophatshegetso sa sedika go tlamela morutwana ka ditšhono tsa go ithuta le go gola.

Dikolo di tshwanetse go netefatsa gore diphaposiborutelo tsotlhe le barutabana ba na le didiriswa tse di lekaneng e bile di le maleba go ka dirisiwa ke barutwana botlhe go sa kgathalasege dikgoreletsathuto tse di leng teng. Seno se akaretsa:

- barutabana ba ba katisitsweng go lemoga dikgoreletsathuto
- diitogamaano tsa methalethale tsa thuto
- paakanyo e e lekaneng ya phaposiborutelo
- bogolo jo bo kgonegileng jwa phaposiborutelo
- bathusi ba phaposiborutelo.

Ka go ikatisa ...

- Lekola barutwana botlhe fa ba amogelwa mo Mophato R mme o rekote diphitlhelelo tsa gago ka ga Porofaele ya Morutwana go latela Pholisi ya Bosetšhaba ya Tekolo, Tlhaolo, Tlhatlhobo le Tshegetso (Screening, Identification, Assessment and Support (SIAS)).
- Direla barutwana ba ba itemogelang dikgoreletsatshuto Lenaneotshegetso la Morutwanakaesi (Individual Support Plan (ISP)). Tshedimosetso eno e tshwanetse go abelanwa le batsadi le/kgotsa batlhokomedi gore ba itse ditlhokego dingwe le dingwe tsa tlaleletso le lenaneotshegetso la ngwana wa bona.
- Dirisana le Setlhophatshegetso sa Sekolo go tlamela ka tshegetso e e tlhokegang. Morutwana o romelwa kwa Setlhophengtshegetso sa Sedika fa tshegetso ya tlaleletso e tlhokagala.

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.

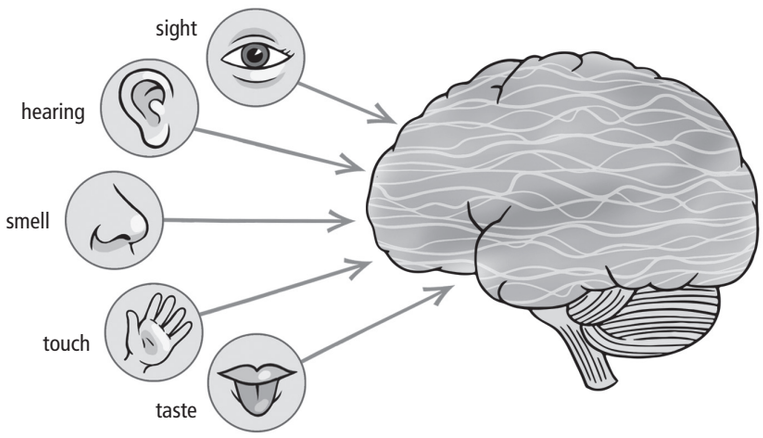


Figure 30 Our five senses

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?

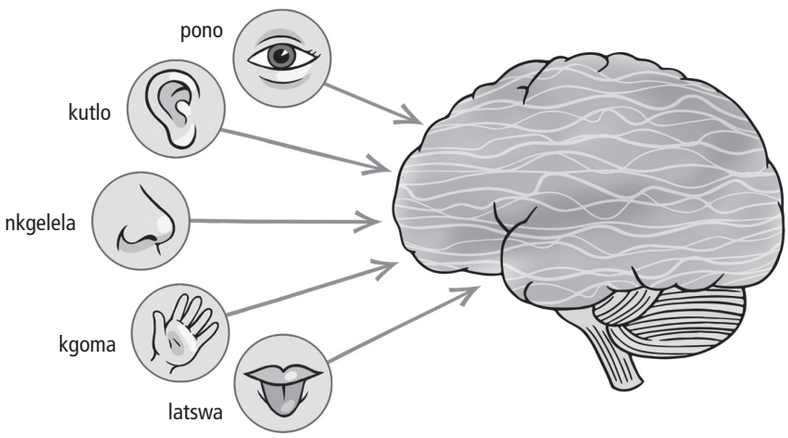
Kgolo ya tlhaloganyo le mesifa

Kgolo ya dikgoni tsa tlhaloganyo le mesifa mo baneng ba bannye e botlhokwa thata mo go aleleng bokgoni jwa go ithuta dipalo mo isagong motheo. Go tlhaloganya ga ditemosi go kaya tiriso ya ditemosi go bona tshedimosetso ka ga tikologo. Dikgono tsa tlhaloganyo ya ditemosi di botlhokwa go ithuta dipalo gonne di re thusa go tlhaloganya:

- ka moo dilo di golaganang ka teng
- dintlhatshwano le dipharologantsho
- selekanyo, sebopego le paterone
- boalo le sebopego
- matshwao le bokao jwa ona.

Dikgono tsa go tlhaloganya di re kgontsha go tlhaloganya lefatshe le le re dikologileng. Tshedimosetso ya ditemosi e kgobokanngwa ke ditemosi tsa rona tse tlhano, sekao, se matlho a rona a se bonang, ditsebe di se utlwang, letlalo le se utlwang, leleme le se latswang le nko e se nkgelelang.

Tshedimosetso eno e romelwa kwa bobokong jwa rona. Tlhaloganyo e a sekaseka, e rulaganya le go gakologelwa tshedimosetso eno gore re tle re e dirise mo nakong e e tlang fa re dira ditirwana tse di jaaka go buisa, go rala, go kwala, go sega, go feleletsa diphazele, go rarabolola dipalo, go itumelela kanelo, go apara, go bona setlhako sa gago mo khabotong, go opela mmogo le dikgono tse dingwe tse dintsi.



Setshwantsho 30 Ditemosi tsa rona tse tlhano

Ka go ikatisa ...

Ela tlhoko barutwana fa ba tshameka kwa ntle le mo gare ka didiriswa tse di farologaneng.

A ba ka:

- ~ tlhalosa pharologanyo magareng ga medumo le mafoko a a farologaneng?
- ~ supa pharologano magareng ga ditshwantsho tse pedi kgotsa ditlhopha tsa dilo?
- ~ gopola se ba se boneng le se ba se utlwileng?
- ~ boeletsa lenaane la mafoko kgotsa dinomore ka tatelano e e nepagetseng?
- ~ tsibogela medumo e e farologaneng, maina a yona, ditaelo?
- ~ utlwa pharologano magareng ga boleta/borethe le bogwata?
- ~ utlwa pharologano magareng ga botshe le botlha fa a thibilwe matlho?

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.

Dikgono tsa mesifa ke ditiragalo tse di akaretsang tiriso ya mesifa ya rona. Re dirisa mesifa e megolo mo mebeleng ya rona go dira ditiro tse di tlhokang mesifa e megolo, sk. go raga kgwele, go taboga le go tlola. Re dira mesifa e mennye go dira ditirwana tse di tlhokang mesifa e mennye, sk. go sega, go kwala le go rala.

Kgolo ya temosi ya bokgoni jwa go dirisa mesifa e akaretsa tse di latelang:

- tlhaloganyo ya pono
- tlhaloganyo ya kutlo
- tlhaloganyo ya go tshwara
- tlhaloganyo ya tsamaisommele.

Grade R Maths e lemoga botlhokwa jwa dikgono tseno mo kgodisong ya megopolo ya dipalo mo barutwaneng ba Mophato R.

Tlhaloganyo ya pono
Tlhaloganyo ya pono ke bokgoni jwa boboko go dirisa se matlho a se bonang le go ranola tshedimosetso eno. Dikgono tsa tlhaloganyo ya pono di botlhokwa mo tirisong ya dilo, go rala, go buisa le go kwala mo dipalong.

Kgethololopono

Kgethololopono ke bokgoni jwa go bona dintlhatshwano le dipharologano magareng ga dilo. Sekao, go lemoga ditshwano le tse di farologaneng magareng ga dibopego tsa 2-D jaaka setshwantsho sa khutlonne le khutlonnetsepa.

Tirisano ya mesifa ya pono

Tirisano ya mesifa ya pono ke bokgoni jwa matlho, boboko le mesifa ya mmele go dira mmogo go diragatsa. Mo dipalong, e botlhokwa mo ditirwaneng tse di jaaka go dirisa dilo, go rala le go kwala.

Ditirwana tse di thusang go godisa dikgono tsa tirisano ya mesifa ya pono di akaretsa:

- kgwele le metshameko ya dibinibeke
- tiriso ya dibolokokago
- go tshameka ka dilo tse di dikologang kgotsa tse di relelang
- go rala dipaterone
- go sega le go kgomaretsa
- go tsenya tlhale mo nnaleteng.

Pheleletso ya setshwantsho

Pheleletso ya setshwantsho ke bokgoni jwa go feleletsa dilo, ditshwantsho kgotsa dithalo tse di sa felelediwang. Ka mafoko a mangwe, morutwana o kgona go lemoga le go tlhaola selo sotlhe le fa bogotlhe jwa setshwantsho bo sa felelediwa. Barutwana ba ba sokolang ka go feleletsa setshwantsho ba tlaa, sekao, bona go le thata go kopanya diphazele. Ba ka tswa gape ba na le mathata a go tlhalosa gore go tlhaelang mo setshwantshong se se bontshang letlhakore la moja la sefatlhego fela kgotsa mmele, kgotsa go feleletsa setshwantsho.

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.

Popobosafetogeng le popokgopolo (temogo)

Popobosafetogeng ke bokgoni jwa go tlhalosa pharologano magareng ga dibopego le matshwao, le fa bogolo le maemo a tsona a ka fetoga. Ka mafoko a mangwe, go kaya go kgona go lemoga dipharologantsho tse di sa fetogeng tsa sengwe. Sekao, sediko ke sediko ka ntlha ya sebopego sa sona. E sala e ntse e le sediko le fa e le tala, phepole, kgolo kgotsa nnye, mo bukeng kgotsa e thadilwe mo motlhabeng. Ka yona tsela eo, letshwaopalo '5' ga e fetoge go sa kgathalasege gore a e kwadilwe ka mebala e e farologaneng kgotsa ka mokwalo o mogolo kana o monnye.

Kakanyo ya setshwantsho se se bonalang

Kakanyo ya setshwantsho se se bonalang ke bokgoni jwa go lemoga pharologano magareng ga dilo tse di bonalang le tse di tlhagelelang e le lemorago. O ka thusa barutwana go godisa kgono eno ka go ba kopa go tlhaola dilo tse di rileng mo setshwantshong kgotsa mo dilong tse di kgobokantsweng, sk. 'Batla mosetsana yo o apereng borukhu jo bohibidu mo setshwantshong' kgotsa 'Batla lebokoso le le nang le dinamune mo setshwantshong' kgotsa 'Batla ditlhako tsa gago mo mokoeng ono wa ditlhako tsa rona rotlhe'.

Tlhatlhamiso ya pono

Tlhatlhamiso ya pono ke bokgoni jwa go baya dilo kgotsa dilwana ka tatelano e e nepagetseng morago ga go di lebelela kgotsa go di ela tlhoko. Thusa barutwana go godisa kgono eno ka go ba kopa go lebelela paterone ya dibaga tsa mebala e e farologaneng mo mogaleng le gore ba boeletse paterone ka bobona.

Tomagano ya mesifa ya pono

Tomagano ya mesifa ya pono ke bokgoni jwa go tlhaloganya tshedimosetso ya pono le go e dirisa mo tirwaneng e nngwe e e dirisang dikgono tsa mesifa. Barutwana ba dirisa tshedimosetso ya pono le dikgono tsa go kwala le go tshwara fa, sekao, ba kopolola dinomore kgotsa ba rala dilo tse di fa pele ga bona.

Popotshwantsho

Popotshwantsho ke bokgoni jwa go bopa ditshwantsho mo tlhaloganyong (ditshwantsho tsa tlhaloganyo) tse di ikaegileng ka maitemogelo, kelotlhoko kgotsa tshedimosetsopono e nngwe. Barutwana ba dirisa kgono eno, sekao, fa ba rala ditshwantsho tsa sengwe jaaka phaposi kwa magaeng a bona kgotsa a balelapa.

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.

Kakanyokutlo
Kakanyokutlo ke bokgoni jwa boboko go dirisa se ditsebe di se utlwang le go ranola tshedimosetso eno. Kakanyokutlo e botlhokwa go godisa dikgono tsa puo, go latela le go tlhaloganya ditaelo mmogo le go abelana dikakanyo le go buisana mmogo le tshedimosetso.

Kgethololokutlo

Kgethololokutlo ke bokgoni jwa go lemoga dintlhatshwano le dipharologano mo modumong, sk. go kgona go utlwa pharologano magareng ga mafoko 'khutlonnetsepa' le 'khutlotharo'.

Kgopolokutlo

Kgopolokutlo ke bokgoni jwa go boloka le go gopola sengwe se o se utlwileng. Barutwana ba dirisa kgono eno fa ba latela motseletsele wa ditaelo kgotsa ba boeletsa tlhatlhamano ya dinomore e e buisetswang kwa godimo, sk. 4, 6, 8, 1.

Kakanyotlhophokutlo

Kakanyotlhophokutlo ke bokgoni jwa go lemoga kgotsa go tlhopholola modumo go tswa mo medumong e mengwe. Gape ke bokgoni jwa go tota modumo o o rileng kwa ntle ga modumo wa lemorago. Kgono eno e letla barutwana go tota se mongwe mo setlhopheng o se buang kwa ntle ga go kgorelediwa ke modumo wa ditlhopha tse dingwe fa di bua.

Tlhatlhamisokutlo

Tlhatlhamisokutlo ke bokgoni jwa go gopola dilo kgotsa dilwana ka tatelano e e nepagetseng morago ga go utlwa lenaane. Sekao, tatelano ya dinomore go tloga ka 1 go fitlha ka 10 kgotsa dikgwedi tsa ngwaga. Go kopa barutwana go tlhalosa ditiragalo tse di mmalwa tsa letsatsi ka tatelano go thusa go godisa kgono eno.

Kakanyo ya go tshwara le tsamaiso ya mmele
Kakanyo ya go tshwara ke bokgoni jwa go dirisa temosi ya kgomô go batlisisa tikologo ya gago. Kakanyo ya tsamaiso ya mmele ke kitso ya tsamaisommele le maemo mo sebopegong. Di dira mmogo go neela boboko tshedimosetso. Tirwana e e thusang go godisa kakanyo ya barutwana ya go tshwara le tsamaiso ya mmele ke go ba kopa go tswala matlho, mme ba kgome le go tlhalosa dilo di le mmalwa tse di farologaneng mo kgetsaneng kgotsa kgetsaneng ya mosamo. Sekao, ba ka re e na le dikhutlo/e kgolokwe.

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. Molawana wa tiragatso

Tlhaloso

Barutwana ba tshwanetse go nna le nako e ntsi ya go diragatsa dikgono tse dišwa le kitso. Fa barutwana ba ikatisa gangwe le gape ka go diragatsa se ba setseng ba se ithutile, ba nna botoka mo go sona le go itshepa botoka. Ba itumelela poeletso le ikatiso. Morutabana wa Mophato R o tshwanetse go neela barutwana ditšhono tsa go ikatisa/diragatsa le go tokafatsa dikgono tse dišwa.

Ka go ikatisa ...

- Go bala le go rarabolola dipalo di dirwa letsatsi le letsatsi jaaka ditirwana tse di dirwang gangwe le gape – le fa e le gore go totilwe megopolo e mengwe jaaka sebopego kgotsa tekanyo.
- Tlamela ka didiriswa tsa methalethale le ditiro tsa methalethale gore barutwana ba diragatse dikgono tse dišwa tse ba di ithutileng ka ditsela tse di farologaneng.
- Megopolo ya dipalo le yona e ka diragadiwa go ralala kharikhulamo, sekao mo ditirwaneng tsa Puogae le Dikgono tsa Botshelo jaaka dikanelo, terama, go penta le dibako tsa sekgoreletsi.

Go le gontsi ka ga molawana wa tiragatso

Go dirisa merumo, dipina le dikanelo

Go opela dipina le go boeletsa merumo mmogo, le go tseelana dikanelo ke tsela e e itumedisang e e rutang ka tsela e e seng ya kgaisano. Barutwana ba ithuta megopolo le dikgono tsa dipalo fa ba boeletsa merumo le dipina, le fa ba reetsa dikanelo gangwe le gape. Ba ithuta le go ikatisa ka:

- mainapalo (sk. 'Go ne go na le boramošwe ba bannye ba le bararo …')
- tatelano ya mainapalo
- go balela kwa pele le kwa morago
- go bala ditlhopha tsa dilo
- dipalelo tse di sa rulaganngwang, sk. go tlhakanya le go ntsha
- tlhatlhamano ya ditiragalo.

Ka go ikatisa ...

- Tlhakanya mosuto, morumo le mmino mo dipineng, merumong le dikanelo go di dira monate le go feta. Maitemogelo a a dirisang ditemosi tsotlhe tsa rona a thusa barutwana go gakologelwa dilo bonolonolo.
- Rotloetsa batsadi le batlhokomedi ba bangwe go ithuta dikanelo, dipina le merumo e o e dirisang le barutwana. Ka tsela eno, ba nna dikgokagano tsa botlhokwa tsa bana magareng ga ditirwana tsa kwa gae le tsa kwa sekolong.

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.

Tomagano ya dipalo go ralala lenaneo la letsatsi le letsatsi la Mophato R

Barutabana ba tlhoka go dira dikgokagano magareng ga dipalo, ditlwaelo tsa letsatsi le letsatsi le dirutwa tse dingwe (sekao Puogae le Dikgono tsa Botshelo), mmogo le magareng ga dipalo le matshelo a letsatsi le letsatsi a barutwana. Barutwana ba tshwanetse go dirisa tshiamelo ya ditšhono tsotlhe go diragatsa dikgono tsa dipalo.

Ka go ikatisa ...

Barutwana ba ka bontsha kgatlhego ya go ithuta dipalo le go bona fa go le bonolo go di tlhaloganya fa ba ka bona ka moo dipalo di dirisegang ka teng le go nna le bokao mo matshelong a bona. Barutabana ba ka thusa ka go dira tse di latelang:

- Ka go lemoga thata ka moo dipalo e leng karolo ya bona ya sebele le matshelo a bona a seporofešenale ka teng.
- Ka go bontsha barutwana gore dipalo di dirisiwa jang mo botshelong jwa letsatsi le letsatsi, sk. fa o dirisa madi go reka sengwe.
- Go lomaganya ditirwana tsa dipalo le maitemogelo a mangwe a mo phaposiborutelong le kwa ntle, jaaka:
  - go dirisa dipalokemotatelano 'ntlha', 'bobedi' le 'boraro' fa barutwana ba tlhoma mola
  - go kaya maemo le ntlhakaelo fa barutwana ba tshameka
  - go bua ka ga 'feta' le 'tlase' fa barutwana ba arogana leungo, senkgwe le/kgotsa jusi.
- Go dira dikgokagano le megopolo ya dipalo jaaka bogolo, tekanyo, nako, tekanyetso, go bala, dipapiso, sebopego le/kgotsa sekgala fa o buisetsa barutwana dikanelo.

Go ruta megopolo ya dipalo mo bekeng e e totileng nako ya dipalo tsa Mophato R le go batla ditšhono tse dingwe go godisa puo ya dipalo le megopolo letsatsi lotlhe. Seno:

- se thusa barutwana go godisa go tlhaloganya ka moo dikarolo tse di farologaneng tsa kitso di tsalanang ka teng
- se netefatsa go ithuta go go tletseng
- se neela barutwana ditšhono tse dintsi go diragatsa se ba se ithutileng.

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

KAROLO 2

Dipalo mo Lenaneong la Letsatsi le Letsatsi la Mophato R

Matseno

Lenaneo la *Grade R Maths* le dirilwe go tiisa le go tshegetsa kharikhulamo ya Dipalo tsa Mophato R. *Grade R Maths*:

- e akaretsa le go atolosa diteng tsa Dipalo tsa Mophato R tsa PPKT tse di thadisitsweng mo Dikarolong tse tlhano tsa Diteng
- e rotloetsa go ithuta go go ikaegileng ka go botsa ka go tshikhinya ditsela go atolosa go rata go botsa dipotso ga tlhago ga barutwana go batlisisa tikologo ya bona
- e tlamela ka ditirwana tse di rotloetsang barutwana go tlhotlhomisa le go batlisisa megopolo ya dipalo
- e rotloetsa barutabana go bua le barutwana ka ga se ba se akanyang le go ba thusa go tlhagisa dikakanyo tsa bona
- e tshikhinya ditsela tsa gore barutwana ba ka ithulaganya, ba ela tlhoko le go kgobokanya jang tshedimosetso, le go bapisa, go latedisana, go arologantsha le go ranola diphitlhelelo tsa bona
- go tlamela ka didiriswa tse di maleba.

Dikaroloteng tsa Dipalo

Dipalo mo Kgatong ya Motheo (go akaretsa Mophato R) di lebelela Dikarolo tsa Diteng di le tlhano. Karolo nngwe le nngwe ya diteng e na le seabe mo go godiseng kitso le dikgono tse di rileng tsa dipalo mo ngwaneng. Dikarolo tsa Diteng ke:

- Dinomore, Ditiro le Dikamano (‘Dipaterone, Matshwao le Dikgolagano’)
- Dipaterone, Ditiro le Alejibora (‘Dipaterone, Ditiriso le Alejebera’)
- Boalo le Popego (Jeometeri)
- Tekanyo
- Go Ranola Tshedimosetso (‘Dipalo tsa Tshedimosetso’)

O ka batlisisa go le gontsi ka ga Karolo ya Diteng e nngwe le e nngwe mo PPKT le mo Karolong 3 ya kaedi eno (tsebe 111).

Peelonako ya Dikarolo tsa Diteng tsa Dipalo

PPKT e tshikhinya gore nako ya go ruta Dipalo mo Mophato R e tshwanetse go nna diura di le 23 ka beke. Le fa go ntse jalo, PPKT ga e tlamele ka ga peelonako kgotsa kgaogano ya nako e Mophato R o tshwanetseng go e tsaya mo Karolong ya Diteng mo kgweditharong e

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

nngwe le e nngwe. Peelonako ya Karoloditeng ya Dipalo e thusa ka ga maitlhomo a mabedi a botlhokwa:

- E kaela tebang le bokaakang jwa nako jo bo tlhokegang go lepalepana le diteng mo Karolong e nngwe le e nngwe ya Diteng mo go lekaneng.
- E kaela ka ga gore ka nako ya tlhatlhobo dikarolo tse di farologaneng tsa kharikhulamo ya Dipalo tsa Mophato R di ka neelwa nako e kana kang.

Lenaneo la *Grade R Maths* le tshikhinya peelonako e e lekanyeditsweng Dikarolo tsa Diteng. Seno se ikaegile ka:

- Dikaroloteng tsotlhe di botlhokwa le fa go se kitla go dirisiwa nako e e lekanang mo go e nngwe le e nngwe ya tsona.
- Dikaroloteng tse dingwe di tlhoka nako e ntsinyana go godisa megopolo, sk. Nomore, Dinomore, Ditiro le Dikamano, le Boalo le Popego (Jeometeri).

Lenaneo la *Grade R Maths* le tota Karoloditeng e e rileng mo bekeng e nngwe le e nngwe fa le netefatsa tsolotanyo le tomagano ya kitso e ntšhwa. *Kaelo ya Ditirwana* tsa kgweditharo nngwe le nngwe e rulaganya diteng le palo ya dibeke e ikaegile ka peonako eno go netefatsa gore Karoloditeng ya setlhogo sa PPKT le kgodiso ya megopolo ya botlhokwa e dirilwe. Papetla e e fa tlase e bontsha palo ya tebelelo ya diteng e e tlhokegang mo Karolong e nngwe le e nngwe ya Diteng mo kgweditharong nngwe le nngwe.

Papetla I Palo ya Dibeke go ya ka Karoloditeng mo kgweditharong nngwe le nngwe

Peonako ya Diteng tsa Dipalo tsa Mophato R							
Karoloditeng	**Setlhogo**	**Kgweditharo 1 dibeke**	**Kgweditharo 2 dibeke**	**Kgweditharo 3 dibeke**	**Kgweditharo 4 dibeke**	**Palogotlhe ya dibeke ka ngwaga**	**Palogotlhe ya % ya nako**
Dinomore, Ditiro le Dikamano	Go bala Temogo ya palo Temosi ya palo (dikamano) Tharabololo ya dipalo Dipalelo	3	4	5	5	17	42,5
Dipaterone, Ditiro le Alejibora	Tlhaola, kopolola, atolosa le go tlhama dipaterone tsa gago	1	1	1	1	4	10
Boalo le Popego (Jeometeri)	Maemo, tlwaetso le tebo Dilo tsa 3-D le dibopego tsa 2-D Tekano	4	3	2	2	11	27,5
Tekanyo	Nako	1				4	10
	Boleele		1				
	Boima			1			
	Mothamo/ Volumo ('Bolumu')				1		
Go Ranola Tshedimosetso	Kokoanya, rulaganya, tlhagisa le go sekaseka dilo/ tshedimosetso	1	1	1	1	4	10
Palogotlhe ya dibeke		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).

Dipalo le lenaneo la letsatsi le letsatsi la Mophato R

Lenaneo la letsatsi le letsatsi

Lenaneo la letsatsi le letsatsi la Mophato R ke lenaneonako le le nang le diponagalo tsa lona. Ga le tshwane le mananeonako a a dirisiwang mo mephatong e mengwe mo sekolong. E tlamela ka ga ditlhokego tsa kgolo ya bana fa ka fa letlhakoreng le lengwe e tlhokomela ditlhokego tsa pholisi ya PPKT.

Sethalo sa lenaneo la Mophato R la letsatsi le letsatsi (Setshwantsho 31) se akaretsa kgaoganyo ya nako e e lekanyeditsweng jaaka kaelo go barutabana. Dinako tseno di tlhoka go kgona go ka fetolwa mo Mophato R, fela go tshwanetse ga nna le:

- diura di le 4 le metsotso e le 36 ka letsatsi (kgotsa diura di le 23 ka beke) tsa nako ya go ruta le go ithuta
- ditirwana tse di akaretsang dirutwa di le tharo: Puogae (diura di le 10 mo bekeng), Dipalo (diura di le 7 ka beke) le Dikgono tsa Botshelo (diura di le 6 ka beke).

E nngwe le e nngwe ya dirutwa e na le thuto ya letsatsi le letsatsi mme gape e lomagantswe le ditirwana tse dingwe mo letsatsing. Lenaneo la letsatsi le letsatsi mo Setshwantshong 31 le baya pontsheng nako e e totileng dipalo mmogo le ditšhono tsa ditiragalo tsa go ithuta dipalo. Go ithuta dipalo go diragala mo:

- thutong ya phaposiborutelo yotlhe moo barutwana ba dirisanang jaaka setlhopha se segolo le morutabana
- dithuto tsa ditlhopha tse dinnye tse di kaelwang ke morutabana moo bokana ka barutwana ba le robedi ba dirang le morutabana
- dithuto tsa setlhopha se sennye moo bokana ka barutwana ba le robedi ba dirang ditirwana mo dipapetleng ka boikemedi (diteišenetiro)
- dithuto tsa boitlhophelo ka tokologo moo barutwana ba itlhophelang se ba batlang go se dira go tswa mo tlhophong ya ditirwana tse di rulagantsweng ke morutabana (boitlhophelo).

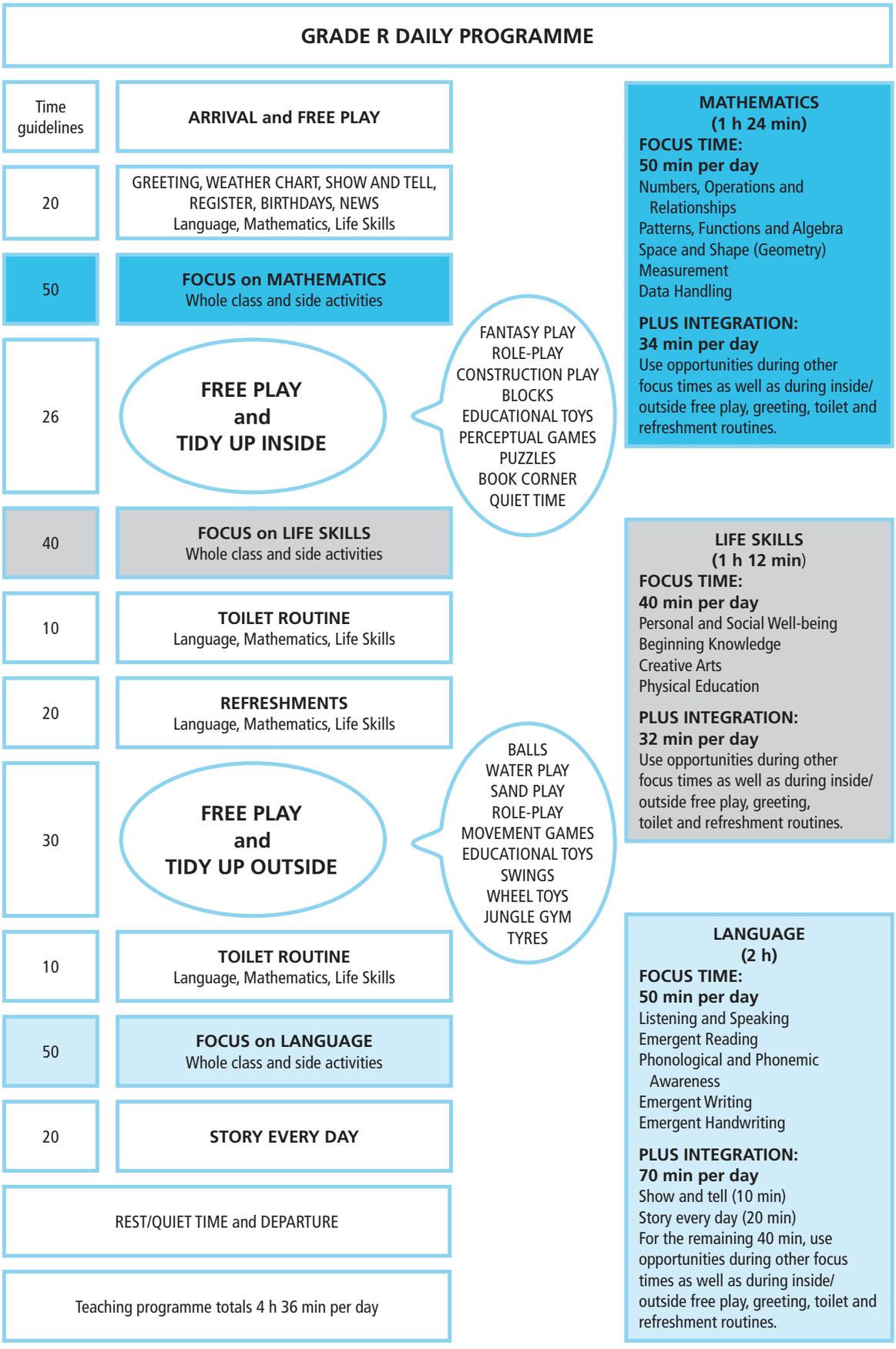


Figure 31 GDE exemplar Grade R Daily Programme

LENANEO LA LETSATSI LE LETSATSI LA MOPHATO R

Dikaelo tsa nako	
	KGOROGO le TSHAMEKO E E LOKOLOGILENG
20	TUMEDISO, TŠHATE YA MAEMO A BOSA, BONTSHA MME O BOLELE, REJISETARA, MALATSI A MATSALO, DIKGANG Puo, Dipalo, Dikgono tsa Botshelo
50	**TEBELELODIPALO** Ditirwana tsa mophato otlhe le tsa kwa thoko
26	**TSHAMEKO E E LOKOLOGILENG le PHEPAFATSO MO TENG** MOTSHAMEKO WA KELETSO MOTSHAMEKO WA KETSISO MOTSHAMEKO WA DIKAGO DIBOLOKO DITSHAMEKISI TSA THUTO METSHAMEKO YA TLHALOGANYO DIPHAZELE SEKHUTLO SA DIBUKA NAKO YA TIDIMALO
40	**GO TOTA DIKGONO tsa BOTSHELO** Ditirwana tsa mophato otlhe le tsa kwa thoko
10	**MOETLO WA NTLWANABOITHUSETSO** Puo, Dipalo, Dikgono tsa Botshelo
20	**DILAPOLOSI** Puo, Dipalo, Dikgono tsa Botshelo
30	**TSHAMEKO E E LOKOLOGILENG le PHEPAFATSO KWA NTLE** DIKGWELE MOTSHAMEKO WA METSI MOTSHAMEKO WA MOTLHABA MOTSHAMEKO WA KETSISO MOTSHAMEKO WA MOTSHIKINYEGO DITSHAMEKISI TSA THUTO DIAKGI DITSHAMEKISI TSA MAOTWANA MALEPA A IKATISO DITHAERE ('DITAERE')
10	**MOETLO WA NTLWANABOITHUSETSO** Puo, Dipalo, Dikgono tsa Botshelo
50	**GO TOTA PUO** Ditirwana tsa mophato otlhe le tsa kwa thotko
20	**KANELO LETSATSI LE LETSATSI**
	BOIKHUTSO/NAKO YA TIDIMALO le GO TSAMAYA
	Lenaneo la go ruta le dira palogotlhe ya diura di le 4 le metsotso e le 36 ka letsatsi

DIPALO
(ura e le 1 le metsotso e le 24)
NAKO E E TOTILWENG:
metsotso e le 50 ka letsatsi
Dinomore, Ditiro le Dikamano
Dipaterone, Ditiro le Alejebera
Boalo le Popego (Jeometeri)
Tekanyo
Go Ranola Tshedimosetso

LE TOMAGANO:
metsotso e le 34 ka letsatsi
Dirisa ditšhono mo dinakong tse dingwe tse di totilweng mmogo le ka nako ya motshameko o o lokologileng wa ka fa teng/kwa ntle, tumediso, ntlwanaboithusetso le dinako tsa dilapolosi.

DIKGONO TSA BOTSHELO
(ura e le 1 le metsotso e le 12)
NAKO E E TOTILWENG:
metsotso e le 40 ka letsatsi
Boitekanelo jwa sebele le Loago
Kitso ya tshimologo
Botsweretshi jwa Boitlhamedi
Thutakatisommele

LE TOMAGANO:
metsotso e le 32 ka letsatsi
Dirisa ditšhono ka nako ya nako e nngwe e e totilweng mmogo le ka nako ya motshameko o o lokologileng wa mo teng/kwa ntle, tumediso, ntlwanaboithusetso le nako ya dilapolosi.

PUO
(diura di le 2)
NAKO E E TOTILWENG:
metsotso e le 50 ka letsatsi
Go reetsa le go Bua
Puiso ya Tshoganyetso
Kitso ya Thutamedumopuo le Difoneme
Go kwala ka Tshoganyetso
Mokwalo wa Tshoganyetso

LE TOMAGANO:
metsotso e le 70 ka letsatsi
Bontsha mme o bolele (metsotso e le 10)
Leinane letsatsi le letsatsi (metsotso e le 20)
Mo metsotso e le 40 e e setseng, dirisa ditšhono mo nakong e e totilweng mmogo le ka nako ya motshameko o o lokologileng wa ka fa teng/kwa ntle, tumediso, ntlwanaboithusetso le dinako tsa dilapolosi.

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.

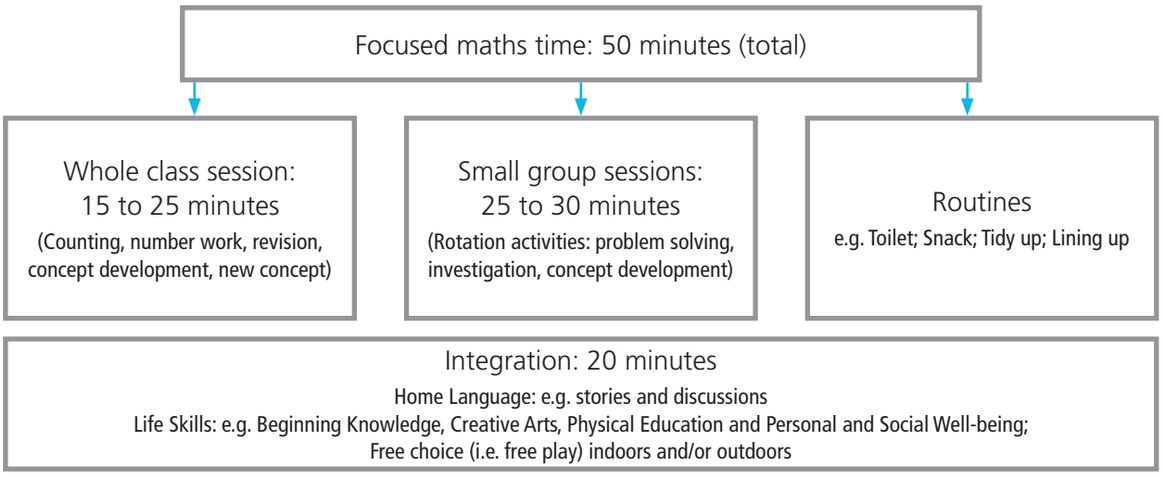


Figure 32 Suggested use of daily maths time

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

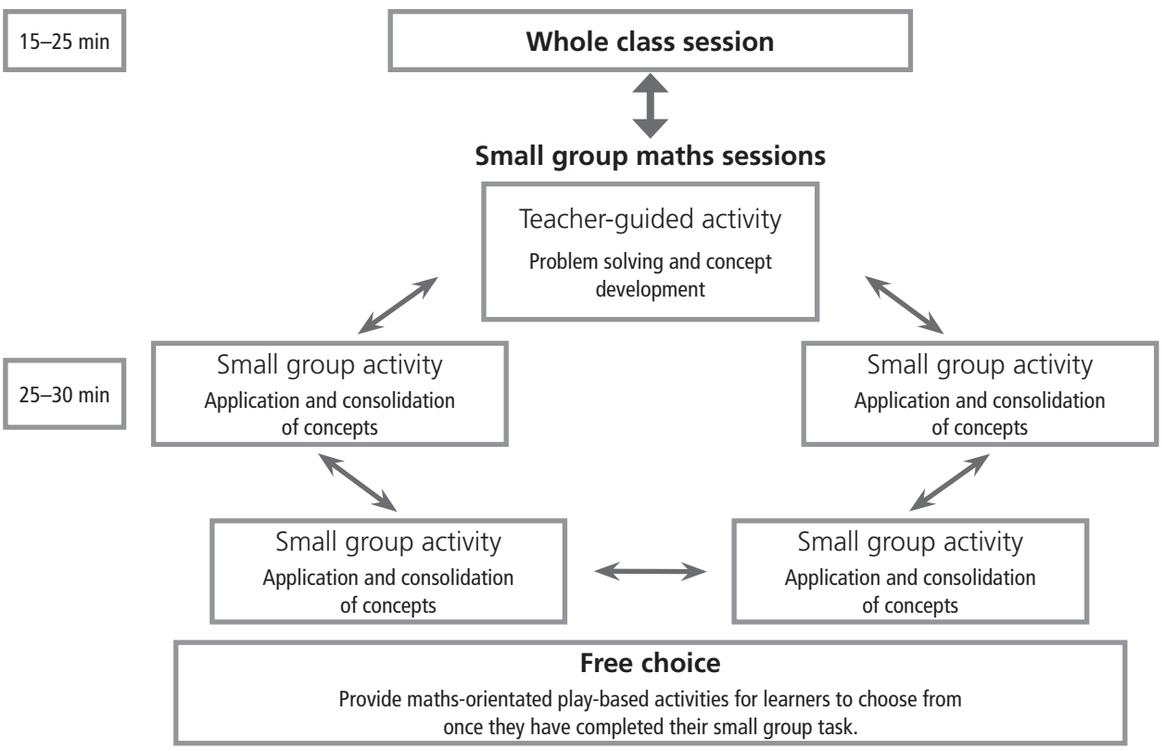


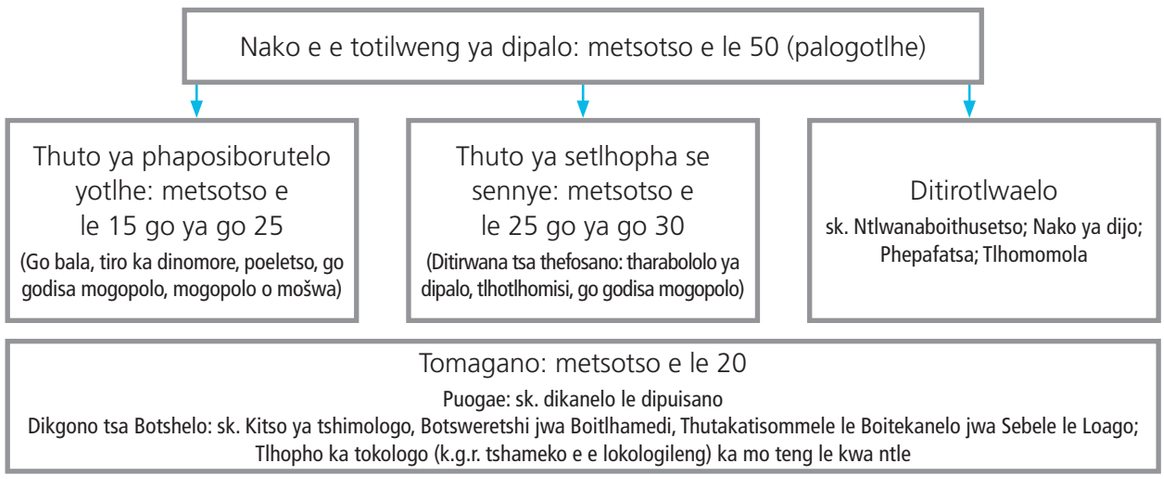
Figure 33 Daily maths focus time in Grade R Maths

Kabelonako ya Dipalo tsa Mophato R

Nako e e abetsweng Dipalo tsa Mophato R ke diura di le supa ka beke le ura e le 1 metsotso e le 24 (metsotso e le 84) ka letsatsi. Ka letsatsi nako e e dirilwe ka:

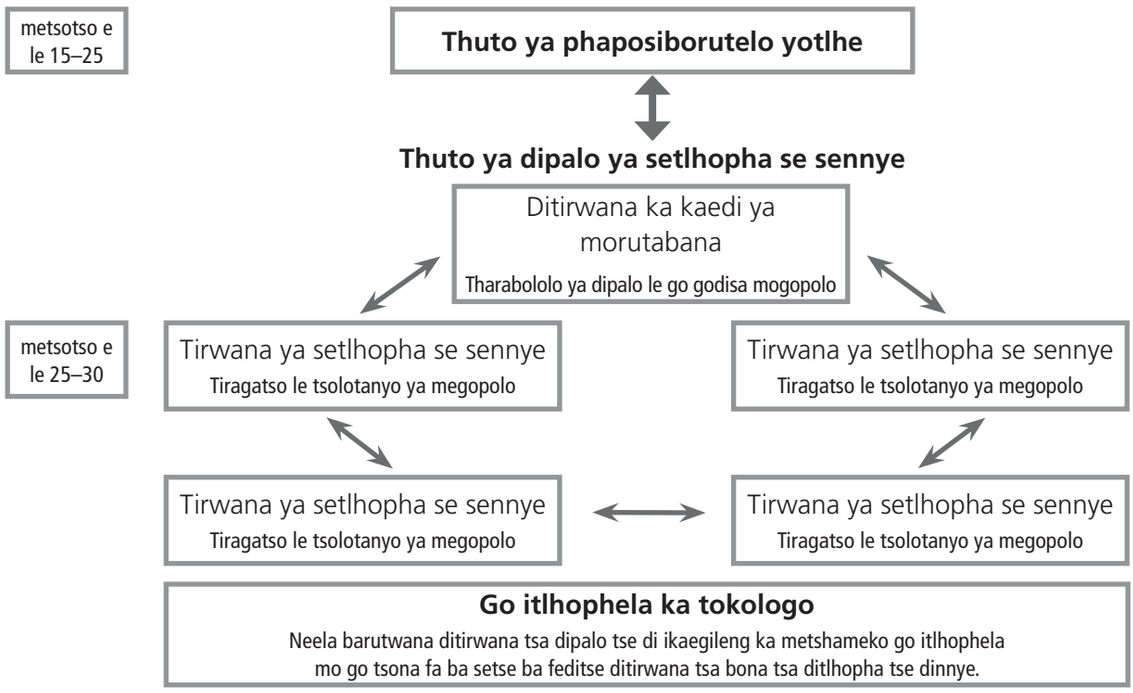
- metsotso e le 50 ya ditirwana tse di totileng go ruta le go ithuta dipalo
- metsotso e le 34 ya go ithuta go go lomaganeng, ditirwana tse di rulagantsweng le ditirwana tsa morutwana ka nosi mo teng le kwa ntle ga phaposiborutelo.

Setshwantsho 32 se bontsha tshikhinyo ya gore o ka dira jang kabelo ya ura e le 1 le metsotso e le 24 letsatsi le letsatsi.



Setshwantsho 32 Nako e e tshikhintsweng go dirisetswa dipalo letsatsi le letsatsi

Setshwantsho 33 se bontsha gore nako e e totileng dipalo letsatsi lengwe le lengwe e rulagantswe mo *Grade R Maths*.



Setshwantsho 33 Nako ya letsatsi le letsatsi e e totileng dipalo mo *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.

Ditirwana tsa tlaleletso tse di ka neelwang barutwana di akaretsa:

- go aga diphazele
- ditirwana tsa go tshameka ka tege
- ditirwana tsa dikago
- metshameko ya thuto
- sekhutlo sa dibuka – 'puiso'
- dibukatiro le dipampiritiro tsa DBE.

Fa ditirwana tse di totilweng tsa dipalo di feditswe, barutwana botlhe ba nna le seabe mo phepafatsong mme ba tswelelele mo karolong e e latelang ya lenaneo la letsatsi le letsatsi.

O ka rulaganyetsa jang phaposiborutelo ya gago dithuto tsa letsatsi le letsatsi tsa dipalo

Latela dikaelo tseno go go thusa go tsenya lenaneo la *Grade R Maths* mo tiragatsong mo phaposiborutelong ya gago letsatsi le letsatsi.

Nako e e totilweng go dirisetswa Dipalo tsa Mophato R e tshwanetse go rulaganngwa sentle le go dirisetswa ditirwana tsa phapoisborutelo yotlhe le tsa ditlhopha tse dinnye. Ditlhopha tse di farologaneng ka bogolo di arabela maitlhomo a a farologaneng a go ruta le go ithuta. Tlhopho ya setlhopha se segolo kana se sennye e tlaa ikaega ka tirwana ya go ruta le tlhatlhobo e morutabana a e rulagantseng. Go laola phoposiborutelo e kgolo go a gwetlha, segolobogolo fa morutabana a rulagantse go tota barutwana ka nosi le go akaretsa barutwana ba ba nang le dikgoreletsathuto.

Thuto ya dipalo ya phaposiborutelo yotlhe

Thuto ya dipalo ya phaposiborutelo yotlhe ka tlwaelo e tsaya metsotso e le 15 le 25 mme barutwana botlhe ba dula ba itirile sediko mmogo le morutabana.

Ditirwana tse di latelang tsa dipalo di ka dirwa ka nako ya fa phaposiborutelo yotlhe e rutwa dipalo:

- tsolotanyo le tiragatso ya megopolo e e rutilweng mo nakong e e fetileng
- tlhagiso ya mogopolo o mošwa
- go atolosa mogopolo o o totilweng segolo mo bekeng
- go balela kwa godimo ka tatelano (merumo, medumo, go latedisanya dipalo)
- dipalo ka tlhogo (go neela dipalo go rarabololwa, metshameko ya kgakologelo)
- go neela ditaelo tsa gore ditirwana di dirwe mo bokaelong jwa ditlhopha tse dinnye fa o ntse o dira ditirwana ka kelo ya morutabana.

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.

Setshwantsho 34 Thuto ya dipalo ya phaposiborutelo yotlhe

Thuto ya dipalo ya setlhopha se sennye

Mo thutong ya setlhopha se sennye, phaposiborutelo e aroganngwa ka ditlhopha tsa barutwana di le tlhano. Letsatsi le letsatsi, setlhopha se le sengwe se dira le morutabana (tirwana ka kaelo ya morutabana) fa ditlhopha tse dingwe tse nne di dira ditirwana tsa dipalo tse di rulagantsweng ke morutabana ka nosi.

Mosola wa go rulaganya ditirwana tsa ditlhopha tse dinnye ka kaelo ya morutabana le ditirwana tsa boikemedi ke go re:

- Didiriswa di le mmalwa di tlhokega thata mo setlhopheng se sennye go na le phaposiborutelo yotlhe, sekao, dikere, dibadi, diboloko, j.j.
- Morutwana mongwe le mongwe o na le tšhono ya go dirisa didiriswa.
- E rotloetsa dikgono tsa tirisano le ba bangwe, sekao, kabelano, go refosana, go bua le go reetsa.
- Barutwana ba tsaya maikarabelo a ditirwana tsa ditlhopha, jaaka go phepafatsa.
- Morutabana o ka dira ditaelo le go botsa dipotso go latela maemo a setlhopha.
- Morutabana o ka ela tlhoko morutwana mongwe le mongwe go netefatsa dikgono tsa boikemedi.

Tiriso ya ditlhopha tse dinnye go neela barutabana ditšhono go aroganya barutwana ka ditlhopha ka dikgono tse di tshwanang ka maemo. Ka mafoko a mangwe, morutabana o kgona go aroganya barutwana ka ditlhopha go ya ka maemo a tshegetso e ba e tlhokang go re ba kgone go ithuta sentle.

Mo nakong ya malatsi a le matlhano, ditlhopha di refosanela ditirwana tse di farologaneng letsatsi lengwe le lengwe. Se se raya gore mo bekeng, barutwana botlhe ba na le tšhono ya go fetsa **tirwana e e kaelwang ke morutabana** le ditirwana tse dingwe tse nne tsa ditlhopha tse dinnye (**palogotlhe ya ditirwana tse di farologaneng tsa dipalo di le tlhano**). Ditirwana di le nne tsa boikemedi (kgotsa **ditirwana tse di kwa thoko**) di tshwanetse go direlwa kwa **diteišeneng tsa tiro** di le nne mo phaposiborutelong – gongwe kwa dipapetleng mo go dutseng barutwana kgotsa ba emeng, kgotsa mo mmetsheng, kgotsa kwa ntle. Ditlhopha di refosana mo nakong ya beke, go ya fela ka gore morutabana o rulagantse jang ditirwana.

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.

Ka go ikatisa ...

Ditsela tsa go aroganyetsa barutwana thuto ya dipalo

Go tswelela go ela barutwana tlhoko ka nako ya ditirwana tsa mo teng le tsa kwa ntle kitso ya barutabana ka bokgoni jwa barutwana le dikgatlhego. Dikitso tseno di tlaa go thusa go aroganya barutwana ka ditlhopha tse di farologaneng. Ditlhopha di ka ikaega ka bokgoni kgotsa di ka dirwa go ya ka matsetseleko a barutwana mo kgonong e ntšhwa.

- Ditlhopha tsa bokgoni: Mo ditlhopheng tseno, barutwana ba mo seemong se se tshwanang sa kgolo. Ka dinako tse dingwe go bonolo go ruta megopolo e mešwa ya dipalo ka go dirisa ditlhopha tsa bokgoni gonne barutwana ba bangwe ba tlhoka nako e ntsi go dira tirwana fa ba bangwe ba tlaa tlhoka go koeletswa ditirwana tse di gwetlhang. Nakonngwe o ka tlhoka gore barutwana ba ba nang le dikgoreletsathuto ba dire le wena go tsolotanya megopolo e e jaaka tsamaelano ya bongwe ka bongwe le go bala dikokoano, kgotsa o ka tlhoka go atolosa barutwana ba ba tsweletseng pele thata ka go ba neela ditirwana tsa dipalo tse di gwetlhang thata.
- Ditlhopha tsa bokgoni jo bo kopaneng: Mo ditlhopheng tseno, barutwana ba na le go tlhaloganya le dikgono tsa maemo a a farologaneng a mogopolo. Mefuta eno ya ditlhopha e dira sentle mo dikagong, tekanyong, dipateroneng le mo ditirwaneng tsa go rulaganya, le mo metshamekong.

Tsela nngwe le nngwe e o e dirisang go aroganya barutwana ka ditlhopha, ditlhopha ga di a tshwanela go tshwana mo nakong e e atolositsweng mme setlhopha sengwe le sengwe se tshwanetse go nna le letshwao la sona (setshwantsho kgotsa sebopego) le leina.

Ditirwana tsa ditlhopha tse dinnye mo kaelong ya morutabana

Mo tirwaneng ka kaelo ya morutabana, morutabana o dira ka setlhopha se le sengwe sa barutwana fa ditlhopha tse dingwe di dira ditirwana tse di rulagantsweng kwa nngweng ya diteišene tsa tiro tse nne.

Ditirwana tse di latelang di tshwanela thata go nna mo bokaelong jwa ditirwana tsa dilthopha tse dinnye mo kaelong ya morutabana:

- tsolotanyo le tiragatso ya megopolo e e rutilweng mo nakong e e fetileng
- go godisa go tlhaloganya mogopolo o mošwa.

Ka go ikatisa ...

Maele a ditirwana tsa dipalo tsa ditlhopha tse dinnye mo kaelong ya morutabana

- Dira ditirwana tse di totileng mogopolo wa Dipalo tsa Mophato R tse di rulaganyeditsweng beke eo.
- Dira le barutwana mo boalong kgotsa mo tafoleng.
- Dira gore tiro e nne ya tirisano, moo wena le barutwana lo kopanang.
- Lo tote go dira ka molomo le ka go diragatsa le barutwana.

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

Setshwantsho 35 Go nyalanya dibadi le dikaratanomore

Ditirwana tsa setlhopha se sennye

Ditirwana tse di latelang di tshwanela thata go nna mo bokaelong jwa ditirwana tsa ditlhopa tse dinnye moo barutwana ba dirang ka nosi go se na morutabana:

- tsolotanyo le tiragatso ya megopolo e e rutilweng mo nakong e e fetileng
- go tlhotlhomisa mogopolo o mošwa o o totilweng thata mo bekeng
- tiragatso ya mogopolo o o totilweg thata mo bekeng.

Ka go ikatisa ...

Maele a go rulaganya le go laola ditirwana tsa dipalo tsa ditlhopha tse dinnye tse di ikemetseng

- Barutwana ba ba nang le motseletsele wa bokgoni ba tshwanetse go kgona go fetsa ditirwana.
- Ditirwana di tshwanetse tsa nna le bokao mo barutwaneng.
- Ditirwana di tshwanetse tsa tlhaloganyega le go nna bonolo gore barutwana ba kgone go di dira ntle le gore ba kope thuso mo morutabaneng.
- Fa barutwana ba dira ka iketlo, tlhotlhomisa mabaka. Fetola tirwana fa go tlhokega.
- Barutwana ba tlhoka go nna le maikarabelo a go dira ditirwana mme ba seke ba tshwenya morutabana yo o tla bong a mekamekane le tirwana e e kaelwang ke morutabana.
- Ruta barutwana melao e e bonolo ya gore ba direng le gore ba itshware jang fa ba dira ditirwana tsa ditlhopha tse dinnye: ba phepafatse jang/ba phuthe jang dilo tsa bona fa ba feditse; le gore ba itshole jang fa ba fetola ditirwana. Boeletsa melao letsatsi le letsatsi go fitlhelela barutwana ba itse le go e latela ka go itirisa. Seno se tsaya nako! Dira ka tsepamo. Baakanya barutwana ka bonolo fa ba gwetlha melao.

Ditirwana tsa go itlhophela ka tokologo

Ditirwana tsa tlaleletso di tshwanetse go neelwa barutwana ba ba feditseng ditirwana tsa bona ka nosi tsa ditlhopha tse dinnye pele ga thuto ya dipalo e ya bokhutlong. Ditirwana tseno di tshwanetse go tsewa e le tsa go tiisietsa

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.

diteng tsa dipalo tse o di rutileng. Barutwana ba tshwanetse go tlhopha tirwana go tswa mo go tse di rulagantsweng ke morutabana. Ditirwana tseno di tshwanetse go tota dipalo, sekao, phazele, diboloko tse di tlhatlaganeng, sethalo, mmalafatso, go bopa, go rulaganya dibopego kgotsa motshameko wa ketsiso.

Thuto magareng ga ditirwana (diphetogo)

Phetogo ke nako ya fa barutwana ba suta go tswa mo tirwaneng e nngwe go e nngwe. Sekao, morago ga thuto ya dipalo ya phaposiborutelo yotlhe e khutle, phaposiborutelo e tlhoka go phepafadiwa le go baakanyetswa thuto e e latelang. Dinako tsa phetogo di tshwanetse go dirisiwa go ikatisa ka ditirwana tsa Dipalo, Puogae le Dikgono tsa Botshelo, sk. go balela kwa godimo, go opela dipaterone diatla.

Barutabana ba ba rulaganyang le go laola diphetogo, gantsi ba nna le diphaposiborutelo tse di edileng gantsi le barutwana ba ba itumetseng, ba ba nang le tirisano mme e bile ba se mo kgatelelong.

Ka go ikatisa ...

Maele go gatelela dipalo ka nako ya diphetogo

- Tsibosa barutwana mo go lekaneng pele ga ba ka tlhoka go fetola ditirwana, sk. 'Mo metsotsong e le mebedi re tlaa digela thuto.'
- Neela ditaelo tse di tlhamaletseng, sk. 'Simolola ka go phutha tse lo di dirang mme lo tlhome mola ka tidimalo mo lebating/dulang fatshe lo dirile sediko.'
- Dirisang 'dingokatheetso' jaaka go bala palo ya go itaya diatla, dipinapalo le merumo, le matshwaopalo (go balela kwa godimo/tlase).

Go rulaganya le go baakanyetsa dithuto tsa dipalo

Go na le dibeke di le 40 mo ngwageng. O tlaa tlhoka go rulaganya le go baakanyetsa beke e nngwe le e nngwe ka maatlametlo.

Mo bekeng pele ga thuto

- Buisa dikarolo tse di maleba tsa *Kaedi ya Mogopolo* le *Kaedi ya Ditirwana*. Tseno di tlhalosa diteng le megopolo e e tlaa rutiwang, le go tshikhinya ditirwana le dipuisano tse di maleba.
- Rulaganya le go baakanyetsa ditirwana beke pele ga di ka rutwa.
- Supa se tlhatlhobo e se totileng. (O ka bona tshedimosetso e ntsi ka ga tlhatlhobo mo tsebeng 99.)
- Baakanya didiriswa tsa beke mme o rulaganye phaposiborutelo.
- Didiriswa tse dingwe di tlhoka go kokoanngwa ka nako go sa le gale, sk. mabokoso a mae, mateng a dipampiri tsa kwa ntlwaneng, dikopi tsa diyokate, mabotlolo a maswi kgotsa dilo tse di tlhokang go rulaganngwa.

Mo gare ga beke

- Tota go tlhaloganya mogopolo wa dipalo o o rutiwang mo bekeng eo.
- Buisa karolo e e maleba mo *Kaedi ya Mogopolo*.
- Letsatsi lengwe le lengwe lebelela gore o na le didiriswa tse di tlhokegang go dirisetswa ditirwana tsa letsatsi le le latelang.
- Itlwaetse ditirwana go sa le gale. Barutabana ga ba a tshwanela go ithulaganya fa barutwana ba dutse ba letile gore tirwana e simololwe go dirwa.

The Grade R Maths programme resources

The Grade R Maths programme has four components.

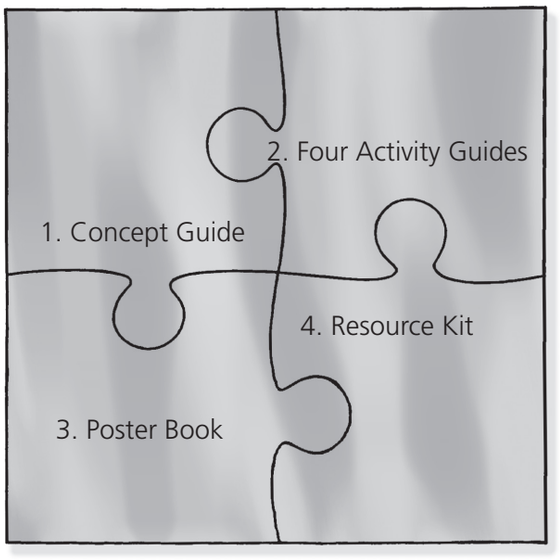


Figure 36 The components of the Grade R Maths programme

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.

Didiriswa tsa lenaneo la *Grade R Maths*

Lenaneo la *Grade R Maths* le na le dikarolo di le nne.

Setshwantsho 36 Dikarolo tsa lenaneo la *Grade R Maths*

Kaedi ya Mogopolo (buka eno)

Buka eno e tlamela ka:

- melawana ya lenaneo la *Grade R Maths* la go ruta bana ba bannye dipalo
- kaelo tebang le gore o ka rulaganyetsa jang go ruta le go ithuta phaposiborutelo ya gago
- ditshikhinyo tsa gore o ka ruta jang dipalo mo Mophatong wa R
- thadiso ya diteng tsa dipalo tse di tshwanetseng go rutwa mo lenaneong la *Grade R Maths*
- dikaelo tsa go dirisa *Grade R Maths*
- lenaanefoko.

Dikaedi tsa Ditirwana

Go na le *Dikaedi tsa Ditirwana* di le nne – e le nngwe ya kgweditharo nngwe le nngwe. Nngwe le nngwe ya *Kaedi ya Ditirwana* e akaretsa:

- molebokakaretso wa gore go tlaa dirwang mo kgweditharong
- setlhogo sa diteng tsa mogopolo wa dipalo se se tlaa totiwang mo bekeng e nngwe le e nngwe
- ditirwana tse di tshikhintsweng tsa beke e nngwe le e nngwe: phaposiborutelo yotlhe, le ditirwana tsa boikemedi mmogo le tsa ditlhopha tse dinnye tse di kaelwang ke morutabana
- maele a go ruta go baakanyetsa le go rulaganyetsa ditirwana tsa dipalo
- tlotlofoko ya dipalo e e ithutiwang ka ditirwana tsa beke e nngwe le e nngwe
- tshedimosetso ka ga didiriswa tse di tlaa tlhokegang mo bekeng
- didiriswa di tshwana le merumo, dipina, dikanelo le dithempoleite.

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

Buka ya Diphousetara

Buka ya Diphousetara ke buka e kgolo e e nang le diphousetara di le lesomenngwe. Diphousetara di diretswe go dirisiwa mo ditirwaneng tsa phaposiborutelo yotlhe le ditirwana tsa ditlhopha tse dinnye tse di kaelwang ke morutabana. Di thusa go golaganya dipalo le botshelo jwa letsatsi le letsatsi mme di ka dirisiwa ka ditsela tse di farologaneng, sk. go bala, go buisanela maemo le kaelo, nako (go tlhatlhamisa ditiragalo) le go rarabolola dipalo.

Kgetsana ya Didiriswa

Kgetsana ya Didiriswa e na le didiriswa tsa botlhokwa tsa go ruta le go ithuta tse di tlaa dirisiwang gangwe le gape jaaka karolo ya ditirwana tsa kaelo ya morutabana. Kgetsana e tlamela ka didiriswa tse di lekaneng setlhopha sa barutwana ba le thataro go ya go robedi. Kgetsana nngwe le nngwe e na le tse di latelang jaaka go supilwe mo Setshwantshong 4 mo tsebeng ya 13:

- dilo tsa go bala, sk. didisiki tse di mmalafaditsweng le dithobane, dibalamaungo le diphologolo, le dibolokokgokedi
- letaese la jambo
- megala ya dibagapopego di le lesome
- dikaratapalo: matshwaopalo (0–10) le mafokopalo (lefela–lesome)
- dibolokoponagalo
- dikaratarontho.

Didiriswa tse dingwe

- tokomane ya pholisi ya PPKT (*CAPS*)
- bukatiro le didiriswa tse dingwe tsa Lefapha la Thutotheo (DBE)

Didiriswa tsa tlaleletso (ga di a neelwa) tse di tlhokegang mo ditirwaneng tsa *Grade R Maths* di akaretsa:

- 'bokoso la phiza'
- tšhate ya bogodimo
- dikarata tsa go tshameka jambo
- letaese: ka dinomore le dibopego
- sekamadi: madi a ditshipi le a dipampiri
- khalentara ya monongwaga
- tshupanako e kgolo ya lenaka ya lebota
- sekalamaleka
- diphaphete
- dibolokopaterone (dibolokoponagalo) le dikarata
- dibotophekese le diphekese
- dibinibeke
- dikgwele tse dikgolo le tse dinnye
- dibaga tsa go bala, go rulaganya, go loga le go dira dipaterone (le megala)
- dibolokokago le diboto
- *Lego*: dilekanyo tse di farologaneng le dibopego
- ditshamekisi tsa dikago
- diphasele: dikarolwana 8, 12, 20, 36 le 48
- letsopa la go bopa/tege ya go tshameka
- sesegakuku

- 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.

- dikhateboto tsa bogolo le dibopego tse di farologaneng
- mabotlolo a polasetiki a a farologaneng le ditshelo go tlhalosa le go bapisa mothamo
- metshameko ya dipalo: *Lotto*, *Ludo*, dinoga le dillere, diphaselesaga, didomino (go akaretsa mmala, sebopego, dipalo, tlhatlhamiso, nyalanyo, dikarologantsho le metshameko ya tlhaloganyo)
- didiriswa tsa go tshameka ka metsi le motlhaba
- dikopi tse di tlhatlaganeng tsa bogolo jo bo farologaneng
- didiriswa tsa go palama, go itsetsepela, go ikakga le go tlola
- lebenkele la dilo tsa motshameko le le nang le dilo tse di ka rekwang ka sebadi sa sekatšhelete
- dikhaontara tsa go tlhaola
- mabokosopolokelo: dilitara di le 40, dilitara di le 5 le dilitara di le 2.

Tlhatlhobo mo Mophato R

Mo Mophato R, tlhatlhobo ke e e tswelelang kgobokanyo e e rulagantsweng, go sekaseka le go ranola tshedimosetso ka ga morutwana. **Tlhatlhobo** e tshwanetse go nna **ya letsatsi le letsatsi** e e tlhomameng le e e sa tlhomamang. Ka mafoko a mangwe, tshedimosetso e e kgobokantsweng ka ga tswelelopele ya morutwana ka nako ya tlhatlhobo e tshwanetse go go thusa go rulaganya ditirwana kana go di fetola go nna maleba. Mo Mophato R, tlhatlhobo e dirisiwa go tsaya ditshwetso ka ga tsela e e maleba tota ya go tshegetsa kgolo ya morutwana mongwe le mongwe.

LENAANEFOKO

tlhatlhobo ya letsatsi le letsatsi
tlhatlhobo e e tlamelang ka tshedimosetso fa thutego e ntse e diragala mme e lekanya tswelelopele ya barutwana

Tlhatlhobo ke kgokagano magareng ga diteng tsa serutwa sa PPKT, ditirwana tsa go ruta le go ithuta. O ka seke wa tlhatlhoba se o iseng o se rute. Maitlhomo a tlhatlhobo ke go:

- tlhomamisa maemo a morutwana mongwe le mongwe
- kaela thulaganyetsothuto le go sedimosa mokgwa wa go ruta
- rotloetsa tswelelopele ya kgolo ya morutwana mongwe le mongwe
- thusa go aga dipegelo tse di botlhokwa mo diphitlhelelong tsa morutwana.

Ka go ikatisa ...

Maele a tlhatlhobo

- Tlhatlhobo ga e a tshwanela go dira gore barutwana ba tlhobaele kgotsa ba boife.
- Ditirwana tsa tlhatlhobo di tshwanetse go nna maleba le go tshwanela pakatheetso ya ngwana mongwe le mongwe.
- Fa o ntse o tsweletse go tlhokomela setlhopha se sennye sa barutwana ba le barataro go ya go ba le robedi mo tirwaneng e e totileng kaelo ka morutabana, barutwana ba bangwe ba tshwanetse gobo ba dira ditirwana ka boikemedi mo ditlhopheng tsa bona tse dinnye mo diteišenetirong tse di farologaneng.
- Dira tirwana e e rileng le setlhopha se le sengwe sa barutwana ba le barataro go ya go ba le robedi letsatsi le letsatsi (go ya ka palo ya barutwana mo phaposiborutelong). Fa barutwana ba dira tirwana, ela tlhoko morutwana mongwe le mongwe mo setlhopheng se sennye mme o botse dipotso go utlwa gore ba akanya jang.
- Tshedimosetso ka ga se barutwana ba se itseng le go kgona go se dira (kgotsa 'bopaki') e tshwanetse go tswelela go kgobokanngwa (letsatsi le letsatsi) mo nakong e e rileng.
- Tshedimosetso ka ga se o se etseng tlhoko e tshwanetse go rekotiwa kwa bokhutlong jwa letsatsi, morago ga nako ya go ruta.

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.

Go botlhokwa go dirisa ditsela tse di farologaneng go tlhatlhoba barutwana. Lebelela dikao tse di latelang.

- Ela tlhoko barutwana ka nako ya ditirwana tsa phaposiborutelo yotlhe, ditirwana tsa ditlhopha tse dinnye mo kaelong ya morutabana le ka nako ya tshameko e e lokologileng mo teng le kwa ntle ga phaposiborutelo.
- Rekota go tlhaloganya ga barutwana ga megopolo e e rileng ya dipalo ka nako ya ditirwana tse di mo kaelong ya morutabana le morago ga tsona.
- Go botsa dipotso le go tlotla le barutwana ka bosi kgotsa ditlhopha tse dinnye tsa barutwana go ka go thusa go tlhaloganya maemo le boteng jwa dikakanyo tsa barutwana le peomabaka ya bona.
- Lebelela dilo tse barutwana ba di dirang mme o di rekote (ka tiriso ya ditshwantsho, dithalo, dilo le/kgotsa 'mokwalo'). Tseno di go bontsha seo barutwana ba se tlhaloganyang le se ba se fitlheletseng.
- Go reetsa le go rekota ditsibogo tsa barutwana (ka tiragatso, ka molomo, tse di kwadilweng) go go letla go dira tlhatlhobotsweledi.

O tlhoka go tswelela go tlhatlhoba barutwana botlhe:

- kitso ya dipalo
- go tlhaloganya dipalo
- dikgono tsa dipalo
- ditsibogo mo tharabololong ya dipalo
- ditsela tsa go dira dilo. (Barutwana ba dirisa ditsela tsa bona go rarabolola ditirwana tsa dipalo. Tseno di ka tswa di farologane gotlhelele le mekgwa e o e dirisang mme ga go kaye go re di fosagetse.)

Tlhatlhobotsweledi e tota e le botlhokwa thata go thusa barutabana mo thulaganyong ya ditirwana, go tlhola tswelelopele ya barutwana le go rulaganyetsa barutwana ba ba itemogelang dikgoreketsi tsa go ithuta tshegetso ya tlaleletso. (O ka bona tshedimosetso ya tlaleletso ka ga dikgoreletsathuto mo ditsebeng 58 le 61.)

Didiriswa tsa tlhatlhobo

Mo Mophato R, tlhatlhobo ga e a tota thata neelomaduo mme e totile thata go tlhola tswelelopele ya barutwana mmogo le go neela tlhaloso e e tletseng ka ga bona. Barutabana ba tshwanetse go dirisa didiriswa tse di latelang fa ba ba tlhatlhoba.

Buka ya go ba ela tlhoko

Mo Mophato R, barutabana ba ela barutwana tlhoko mo phaposiborutelong le kwa ntle, fa ba tshameka ka tokologo le fa ba dira ditirwana tse di rulagantsweng. Go ela barutwana tlhoko go tlaa neela barutabana tshedimosetso ya botlhokwa e e tshwanetseng go sedimosa thulaganyetsothuto ya bona le go tlhopho ya ditirwana. Ka nako e e totileng thuto ya dipalo, morutabana o tlaa dira le setlhopha se sennye se le sengwe letsatsi lengwe le lengwe. Morutabana o tlaa rulaganya tirwana e e rileng e e golaganang le megopolo ya PPKT. Fa barutwana ba ntse ba mekamekane le tirwana eno, morutabana o tlaa ela morutwana mongwe le mongwe tlhoko le go mmotsa dipotso go utlwa gore morutwana o akanya jang le maemo a gagwe a go tlhaloganya.

Fa barutwana ba ile gae, morutabana o tlaa rekota diphitlhelelo tsa dintlha tseno le dilo dingwe gape tse a di lemogileng. Go botlhokwa go dirisa buka ya tshupane go aroganya barutwana go ya ka tlhaka ya ntlha ya sefane.

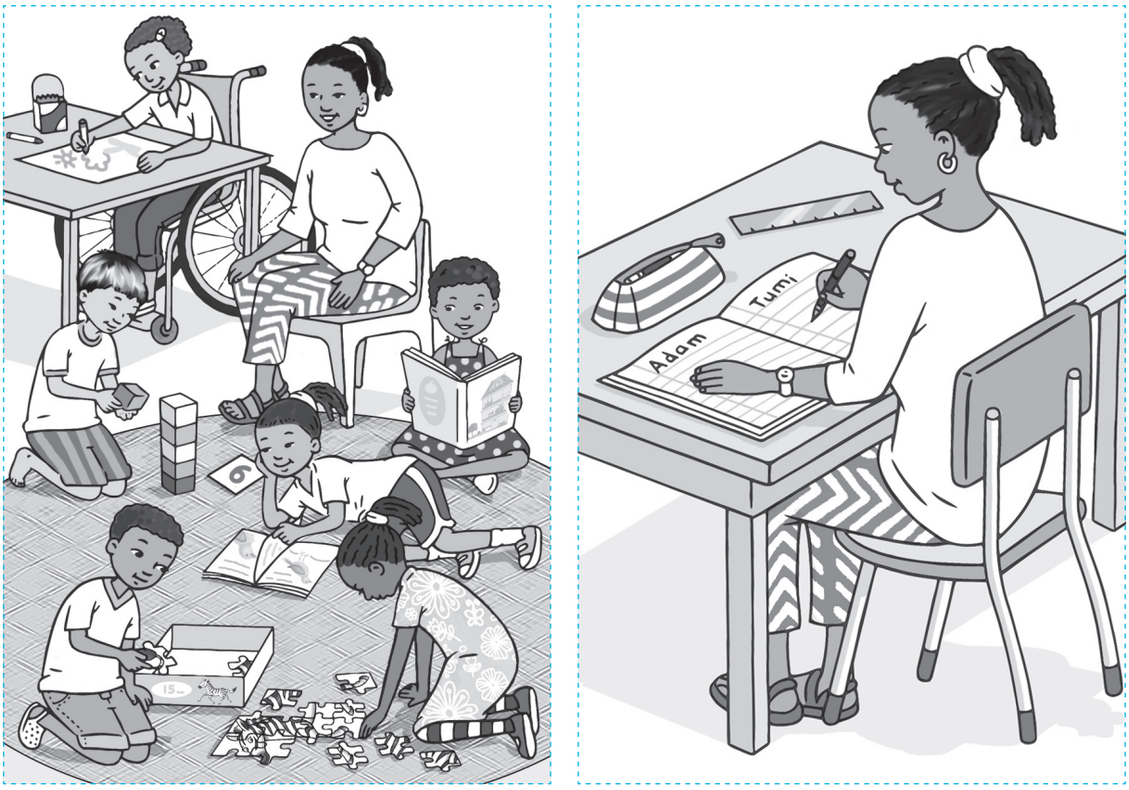


Figure 37 Observe learners then record your observations

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.

Setshwantsho 37 Lebelela barutwana mme o rekote tse o di etseng tlhoko le go di lemoga.

Manaanenetefatso

Lenaanenetefatso ke lenaane la mekgwa ya tlhatlhobo e e neelang tshobokanyo ya dikgono le bokgoni jwa morutwana mongwe le mongwe mo serutweng sengwe le sengwe. Kwa bofelong jwa lenaneo lengwe le lengwe la *Kaedi ya Ditirwana* tsa *Grade R Maths* go na le lenaanenetefatso la tlhatlhobo ya kgweditharo. Lenaanenetefatso leno le tlamela ka tshobokanyo ya diteng tse dišwa tse di rutilweng mo kgweditharong. Morutabana a ka dirisa matshwao go bontsha maemo a phitlhelelo ya morutwana. Sekao, dirisa letshwao la nepagalo fa kgono e fitlheletswe, dirisa sefapaano fa se sa fitlhelelwa, mme o dirise lerontho go supa gore morutwana ga a na bokgoni, mme o bontsha ditshupo gore o sa ntse a le mo tseleng ya go fitlhelela kgono.

Setshwantsho 38 se neela sekao sa gore diteng tse morutabana a tlhokang go di rekota, di ka rulaganngwa jang. Maina a barutwana a rekotiwa mo kholomong ya ntlha mme a latelwe ke letlha la tlhatlhobo. Letshwao (✓ ✗ ●) le tshwanetse go rekotiwa go bapa le leina la morutwana mongwe le mongwe go tsamaelana le mogopolo kgotsa kgono e e neetsweng mo kholomong nngwe le nngwe. Sediriswa seno sa tlhatlhobo se ka tswela morutabana mosola fa a na le kitso e e tseneletseng ka morutwana mongwe le mongwe, e e ikaegileng ka kelotlhoko e e tsweletseng le dintlha tse o di rekotileng mo bukeng ya gagwe ya kelotlhoko.

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

Kgweditharo 1: Sekai sa Rekoto ya Tlhatlhobotsweledi

Letshwao	DINOMORE, DITIRO LE DIKAMANO													DIPATERONE, DITIRO LE ALEJEBERA					DITSHWAELO	
✓ = kgona ● = bokgoni jo bo sa felelang ✗ = ga a ise a nne le bokgoni **Maina a barutwana**	O balela kwa pele go fitlha go 10	O lekanya le go bala dilo 1–5	O balela kwa morago 5–1	O lemoga dinomore mo boaelong jo bo tlwaelegileng	O tlhaloganya dipalokemotatelano, sk. go tlhoma mola	O lemoga dikarataruntho/ditshwantsho 1–3	O lemoga matshwaopalo: 1	O lemoga mainapalo: nngwe	O latedisana dinomore: 1–3	O tlhaloganya tsamaelano ya nngwe ka nngwe	O farologanya magareng ga bontsi le mmalwanyana	O rarabolola dipalo ka dilo tse di tshwaregang	O rarabolola dipalo ka go dirisa menwana kgotsa dibadi	O lemoga dipaterone mo tikologong	O lemoga 'poeletso' mo dipateroneng	O kopolola dipaterone ka go dirisa motsamao wa motantsho wa mmele	O kopolola, feleletsa le go tlhama dipaterone tsa gagwe	O tlhalosa dipaterone tsa gagwe (molao wa poeletso)		Go neela dikhoutu tsa bofelo
Letlha																				

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.

Diruburiki

Ruburiki ke sediriswa se sengwe sa go tlhatlhoba diphitlhelelo tsa barutwana. Le sona se na le lenaane la mekgwa ka tlhaloso ya maemo a tiragatso ya kgono e e rileng. Tlhaloso nngwe le nngwe e tlhalosa se tota morutwana o se dirang kgotsa o se tlhagisang fa a dira tirwana ya tlhatlhobo ya mokgwa oo. Ruburiki e tlhoka go tlamela ka tlhaloso e e kwadilweng sentle le maemo a tiragatso gore tseno di tle di nyalanngwe sentle le tiragatso ya morutwana mongwe le mongwe. Ruburiki ka jalo e kgontsha morutabana go sa tseye letlhakore le go tsepama mo tlhatlhobong ya gagwe le go kaela thulaganyothuto ka jaana e baya dithata le makoa mo kitsong ya morutwana mo pontsheng.

Setshwantsho 39 se neela ka sekao sa ruburiki go rarabolola dipalo tsa go tlhakanya go fitlha ka 10 ka tiragatso.

Tlhaloso ya bokgoni	**Ga a fitlhelela [1]**	**Phitlhelelo e e potlana [2]**	**Phitlhelelo e e lekaneng [3]**	**Phitlhelelo e e itumedisang [4]**	**Phitlhelelo e e tletseng [5]**	**Phitlhelelo ka matsetseleko [6]**	**Phitlhelelo ka dinaledi [7]**
O kgona go rarabolola dipalo tsa go tlhakanya go fitlhelela ka 10.	Ga a kgone go diragatsa tharabololo ya dipalo.	O kgona go diragatsa tharabololo ya dipalo ka go dirisa didiriswa tse di tshwaregang.	O kgona go diragatsa tharabololo ya dipalo, fela ga a kgone go tlhalosa mokgwa o a o dirisitseng go bona karabo.	O kgona go diragatsa tharabololo ya dipalo le go tlhalosa mokgwa o a o dirisitseng fa a kopiwa.	O kgona go diragatsa tharabololo ya dipalo ka boikemedi le go tlhalosa mokgwa o a o dirisitseng go fitlhelela karabo.	O kgona go diragatsa tharabololo ya dipalo mme e bile o kgona go tlhalosa mokgwa o a o dirisitseng.	O kgona go diragatsa tharabololo ya dipalo mme e bile o kgona le go tlhalosa mokgwa o a o dirisitseng le go tshikhinya mekgwa e mengwe.

Setshwantsho 39 Sekai sa ruburiki

Maemo a ditlhalosabokgoni mo ruburiking a ka golaganngwa le dikhoutu tsa seemo. Lefapha la Thutotheo (DBE) le tlamela ka khoutu ya seemo le tlhalosi ya bokgoni, mme e di golaganye le to diperesente (leba Setshwantsho 40). Dikhoutu tsa seemo le ditlhalosi tsa bokgoni di ka fetolelwa go diperesente fa go begiwa tswelelopele ya morutwana.

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.

Khoutu ya seemo	Tlhaloso ya bokgoni	Peresente
7	Phitlhelelo ka dinaledi	80–100
6	Phitlhelelo ka matsetseleko	70–79
5	Phitlhelelo e e tletseng	60–69
4	Phitlhelelo e e itumedisang	50–59
3	Phitlhelelo e e lekaneng	40–49
2	Phitlhelelo e e potlana	30–39
1	Ga a fitlhelela	0–29

Setshwantsho 4.0 Khutu ya seemo

Mo Mophato R tlhatlhobo e totile go tlhalosa tiragatso go na le go e sekaseka kgatlhanong le diperesente. Dipego tse di tlamelang batsadi le barutabana ba bangwe ka tlhaloso e e humileng ya maitshwaro a bana le se bana ba kgonang go se tlhagisa, di botlhokwa thata go tlhatlhoba tiragatso e diperesente di e tlhatlhobang. Go botlhokwa go fapoga ditlhatlhobo tse di sekasekang tshokamo mme di paledisa barutwana go sa le gale mo thulaganyong ya sekolo. Tlhatlhobo e tshwanetse go dirisiwa go bona tshedimoso ya maemo a bokgoni jwa morutwana'go kgontsha morutabana go fetola thulaganyetsothuto le go ruta go akaretsa mmogo le go rotloetsa ngwana mongwe le mongwe mo phaposiborutelong.

O tlaa tlhoka go rekota tlhatlhobo ya tse o neng o di etse tlhoko le 'bopaki' jo bongwe mo jenaleng, le mo letlhareng la kelotlhoko kgotsa mo lenaanenetefatsong. Ka tsela eno, mo gare ga ngwaga, kitso e e feletseng ya morutwana mongwe le mongwe, go akaretsa tse a di kgonang le makoa a gagwe, e agega ka iketlo.

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:

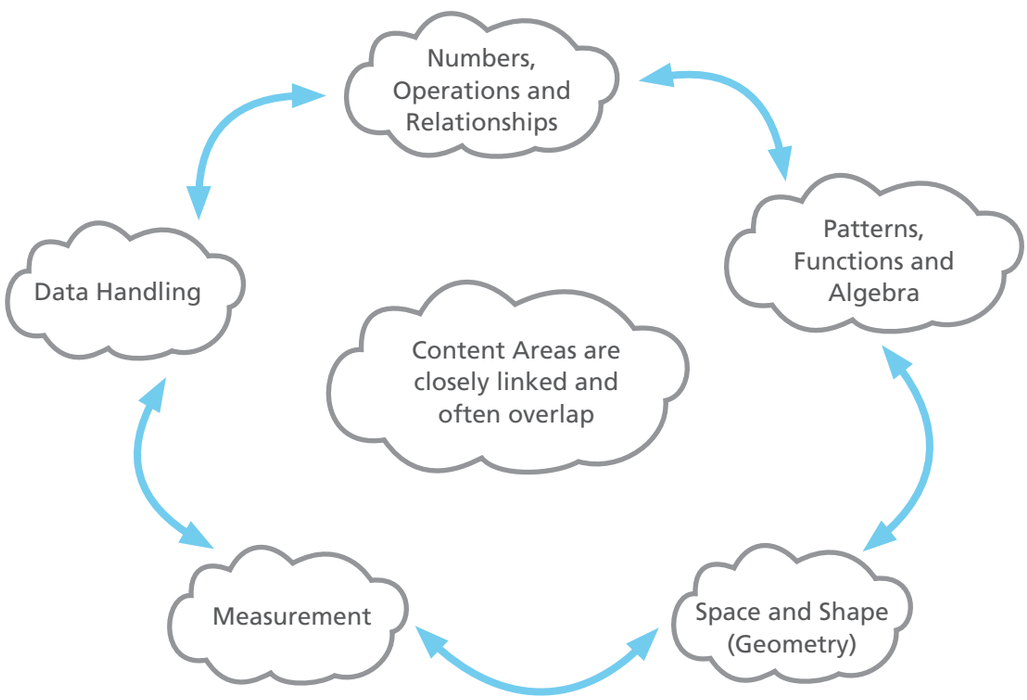


Figure 4.1 Grade R CAPS Mathematics Content Areas

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.

KAROLO 3

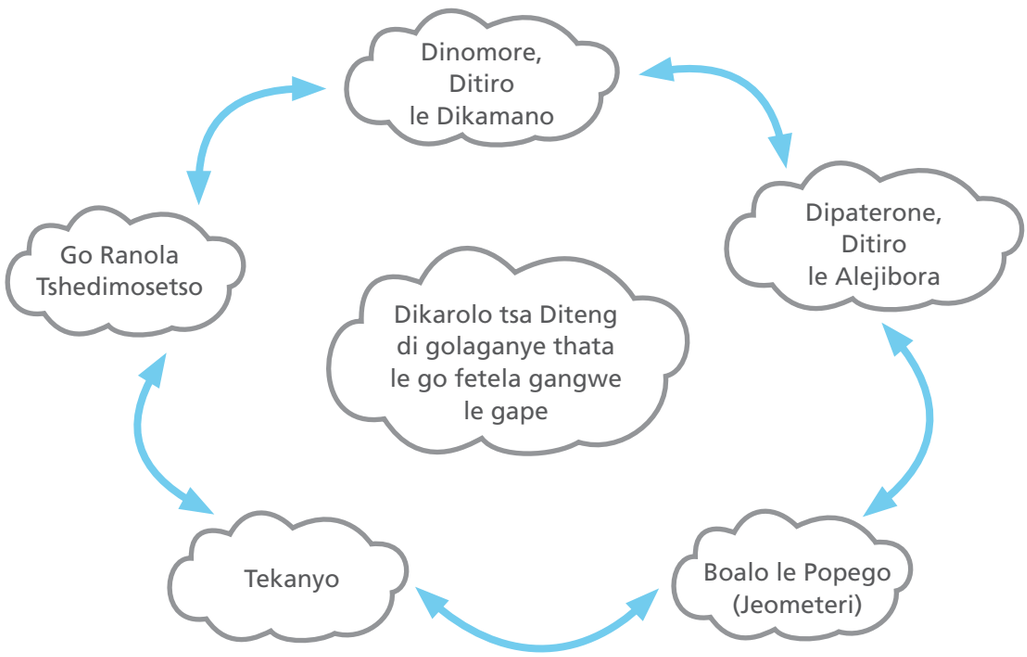
Dipalo mo Mophato R

Matseno

Karolo eno ya *Kaedi ya Mogopolo* e tlamela ka tshobokanyo ya Dikarolo tsa Diteng tsa PPKT ya Dipalo tsa Mophato R le go:

- neelana ka dikakanyo tse di ka tsenngwang mo tirisong mo phaposiborutelong
- tlhalosa megopolo ya dipalo le diteng tse barutabana ba tlhokang go di tlhaloganya
- gatelela kgodiso ya kitso ya dipalo mo barutwaneng ba bannye.

Gape e neelana ka kgaoganyo ya diteng tsa Mophato R tsa Kgweditharo 1–4 (ditsebe 114–137). Dikarolo tse tlhano tsa Diteng ke:



Setshwantsho 4.1 Dikarolo tsa Diteng tsa Dipalo tsa PPKT ya Mophato R

Karolo e nngwe le e nngwe ya diteng e arogantswe ka ditlhogo. Go e nngwe le e nngwe ya ditlhogo tseno tsa *Kaedi ya Mogopolo* e tlamela ka:

- tlhaloso ya setlhogo, e e akaretsang temogo ya megopolo le dikgono tse di rileng
- ditshikhinyo tsa go ruta mo mabokosong a 'Ka go ikatisa'
- tlhaloso ya mareo a dipalo.

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.

Lefa Dikarolo tsa Diteng di supa motlhala o o rileng wa kgolo ya dipalo, tsotlhe di golagane thata mme e bile di fetela kwa ditirwaneng tse dingwe gangwe le gape. Sekao, fa barutwana ba totile tirwana ya tekanyo, ba tlaa tsolotanya dikgono go tswa mo karolong e nngwe ya Karolo ya Diteng, sekao, Dinomore, Ditiro le Dikamano, mme gape ba dirise kitso ya bona ya dinomore, go bala le dikgono tsa go bapisa. Barutwana ba na le ditšhono tsa go diragatsa kitso le dikgono tsa bona mo makaelong a a farologaneng.

Ka go ikatisa ...

Fa barutabana ba totile Dikarolo tsa Diteng tseno ka nako ya go tota dipalo, gape ba tshwanetse go gopola go dirisa bontsi jwa ditšhono mo lenaneong la letsatsi le letsatsi go:

- dirisa puo ya dipalo go tlhagisa le go tiisa megopolo
- dirisa sekai ka go dirisa tlotlofoko e e ikadileng e e golaganang le dinomore, sebopego, boalo, tekanyo le go ranola tshedimosetso.

Ditsela tse di kgonang go dirisiwa go dira seno ke tse:

- Tlamela ka dilo tse di rekilweng, tse di dirisiwang gape le tsa tlhago gore barutwana ba di rulaganye, ba di bapise le go di latedisanya.
- Tlamela ka didiriswa go etsisa le go rekisa, go kala le go lekanya.
- Dira disete tsa ditshwantsho go bontsha tatelano ya ditiragalo mo letsatsing le maemo a bosa mo gare ga beke.
- Lemoga le go bua ka ga sebopego le dipaterone mo ditselaneng, mo difenseng, le mo tshingwaneng ya merogo.
- Rulaganya ditirwana le metshameko moo barutwana ba dirisang dikgono tsa bona tsa sebele le tsa dipalo go latela le go neelana ka dikaelo.
- Golaganya mainane le metshameko ya kwa ntle le dipalo.

Diteng tsa Dipalo

Tshobokanyo e e latelang e tlamela ka papetla ya diteng tsa *Grade R Maths* tse di tshwanetseng go rutwa mo ngwageng wa Mophato R. E bontsha gore ke diteng dife tse di tshwanetseng go rutiwa mo kgweditharong e nngwe le e nngwe.

- Temana e e kwadilweng ka mmala o motala ke diteng tse di tswang mo PPKT ya Dipalo tsa Mophato R.
- Diteng tsa tlhaloso le diteng tse di kwadilweng ka mokwalo o montsho di tsentswe go atolosa le go agelela mo PPKT.
- Ditlhogo di latelana go bontsha tswelelopele e e golang go tswa mo setlhogong se sengwe go ya go se sengwe.

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. DINOMORE, DITIRO LE DIKAMANO					
	SETLHOGO	**KGWEDITHARO 1**	**KGWEDITHARO 2**	**KGWEDITHARO 3**	**KGWEDITHARO 4**
GO BALA					
1.1	**Bala didiriswa (Lekanyetsa le go bala didiriswa go godisa temogo ya dinomore)**	**Mofutapalo: 1–5** Bala ka bongwe: nngwe go nngwe tsamaelano: dikarolo tsa mmele le didiriswa tse di bonalang Itsise Tšhate ya mothusi Itsise mogopolo wa tekanyetso/ phopholetso (tekanyetso e e utlwalang) Dikaratarontho: - lemoga maronthopalo mo dikarateng, didomino le mataese (1–5) - nyalanya didiriswa le ditshwantsho le dikaratarontho Bala gore 'di kae' o dirisa menwana, dikaratarontho, didiriswa mo teng le kwa ntle ga phaposiborutelo, ditshwantsho le ditiragatso, sk. go opa diatla, go itaya maoto	**Mofutapalo: 1–7** Lekanyetsa le go bala Bala ka bongwe: nngwe go nngwe tsamaelano: dikarolo tsa mmele le didiriswa tse di bonalang Boeletsa Tšhate ya mothusi Dikaratarontho: - lemoga palo ya marontho mo dikarateng, didominong le mo mataeseng (1–6) - nyalanya didiriswa le ditshwantsho le dikaratarontho Dirisa makaelo a mefuta, didiriswa le ditiragalo go bala 'di kae'. Menwana, dikaratarontho, dibaga tsa dikago tsa lesome, didiriswa tse dingwe mo phaposing le kwa ntle, ditshwantsho le ditiragalo, sk. go opa diatla, go itaya maoto Bontsha 'go feta ka nngwe/kwa tlase ka nngwe'	**Mofutapalo: 1–10** Lekanyetsa le go bala Bala ka bongwe: nngwe go nngwe tsamaelano; bala tsotlhe: - dikarolo tsa mmele - didiriswa tse di bonalang Boeletsa Tšhate ya mothusi Dikaratarontho: lemoga kgobokanyo ya marontho 1–5 le go fitlha ka 3 go feta mo dikarateng, mataeseng, le didominong Simolola mo nomoreng e e rileng mme o 'tswelele go bala' o ntse o tlolatlola go iphaphatha le molapalo, o dirisa dibaga tsa kago ya lesome, dikaratatshwantsho, terata ya diaparo Bontsha 'go feta ka nngwe/kwa tlase ka nngwe; go feta ka pedi/kwa tlase ka tharo' Opa diatla gantsi/ga mmalwanyana: - ke palo e kae ya go opa diatla e e kwa godingwana/ tlase, godimo thata/ tlase thata	**Mofutapalo: 0–10 le go feta** Lekanyetsa le go bala Bala ka bongwe: nngwe go nngwe tsamaelano; bala tsotlhe: - dikarolo tsa mmele - didiriswa tse di bonalang Boeletsa Tšhate ya mothusi Dikaratarontho: lemoga kgobokanyo ya marontho 1–5 le go fitlha ka 5 mo mataeseng (1–6) le mo didominong Simolola mo nomoreng e e rileng mme o 'tswelele go bala' o ntse o tlolatlola go iphaphatha le molapalo, o dirisa dibaga tsa kago ya lesome, dikaratatshwantsho, terata ya diaparo Bontsha 'go feta ka nngwe/kwa tlase ka nngwe; go feta ka pedi/kwa tlase ka tharo' Opa diatla gantsi/ga mmalwanyana: - ke palo e kae ya go opa diatla e e kwa godingwana/ tlase, godimo thata/ tlase thata Bokao jwa lefela (noto) '0'
1.2	**Bala go ya kwa pele le kwa morago** **Go balela kwa godimo kgotsa ka tatelano (-moribo)**	**Go balela kwa pele: 1–10** **Go balela kwa morago: 5–1** Go bala ka tshoganyetso o dirisa morumo wa dipalo le dipina, ditiragalo tsa letsatsi le letsatsi, metsamao ya mmele, j.j. Bala ka bongwe Mofutapalo: 1	**Go balela kwa pele: 1–15** **Go balela kwa morago: 7–1** Go bala ka tshoganyetso o dirisa morumo wa dipalo le dipina, ditiragalo tsa letsatsi le letsatsi, metsamao ya mmele, j.j. Bala ka bongwe Mofutapalo: 1–4	**Go balela kwa pele: 1–20** **Go balela kwa morago: 10–1** Go bala ka tshoganyetso o dirisa morumo wa dipalo le dipina, ditiragalo tsa letsatsi le letsatsi, metsamao ya mmele, j.j. Bala ka bongwe Mofutapalo: 1–7	**Go balela kwa pele: 0–20 le go feta** **Go balela kwa morago: 10–0** Go bala ka tshoganyetso o dirisa morumo wa dipalo le dipina, ditiragalo tsa letsatsi le letsatsi, metsamao ya mmele, j.j. Bala ka: bongwe, bobedi Mofutapalo: 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

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
1.3	**Matshwaopalo le mainapalo** **Lemoga le go tlhaola matshwaopalo le mainapalo**	**Matshwaopalo: 1, 2, 3** **Mainapalo: nngwe, pedi, tharo** Tlhagisa dinomore o dirisa: - mmele (tsamaiso ya mmele) - didiriswa (tse di bonalang) - ditshwantsho, dithalo (tse di bonalalang go se nene) - dikaratarontho (tse di bonalalang go se nene) Nyalanya le matshwaopalo (ga a bonale) le leinapalo Letshwaopalo: 1 Leinapalo: nngwe	**Matshwaopalo: 4 le 5** **Mainapalo: nne, tlhano** Tlhagisa dinomore o dirisa: - mmele (tsamaiso ya mmele) - didiriswa (tse di bonalang) - ditshwantsho, dithalo (tse di bonalalang go se nene) - dikaratarontho (tse di bonalalang go se nene) Nyalanya le matshwaopalo (ga a bonale) le leinapalo Boeletsa: 1, 2, 3 Boeletsa: nngwe, pedi, tharo Letshwaopalo: 2, 3, 4 Leinapalo: pedi, tharo, nne	**Matshwaopalo: 6, 7, 8** **Mainapalo: thataro, supa, robedi** Tlhagisa dinomore o dirisa: - mmele (tsamaiso ya mmele) - didiriswa (tse di bonalang) - ditshwantsho, dithalo (tse di bonalalang go se nene) - dikaratarontho (tse di bonalalang go se nene) Nyalanya le matshwaopalo (ga a bonale) le leinapalo Boeletsa: 1, 2, 3, 4, 5 Boeletsa: nngwe, pedi, tharo, nne, tlhano Letshwaopalo: 5, 6, 7 Leinapalo: tlhano, thataro, supa	Letshwaopalo: 0 to 10 Leinapalo: lefela (noto), robedi, robonngwe, lesome Tlhagisa dinomore o dirisa: - mmele (tsamaiso ya mmele) - didiriswa (tse di bonalang) - ditshwantsho, dithalo (tse di bonalalang go se nene) - dikaratarontho (tse di bonalalang go se nene) Nyalanya le matshwaopalo (ga a bonale) le leinapalo Boeletsa dinomore tsotlhe
KGOPOLOPALO					
1.4	**Dirisa dinomore mo dikaelong tse di tlwaelegileng**	Dirisa dinomore mo dikaelong tse di tlwaelegileng: - bogolo - dinomore mo ditshwantshong le dikaratarontho - metshameko ya dikaratapalo - rejisetara ya botsenelo	Dirisa dinomore mo dikaelong tse di tlwaelegileng: - aterese - dinomore mo ditshwantshong le dikaratarontho - metshameko ya dikaratapalo - dinomore mo dipapatsong/ dipampitshana/ dikarata tsa botsalo - rejisetara ya botsenelo	Dirisa dinomore mo dikaelong tse di tlwaelegileng: - aterese, dinomore tsa mogala - letsatsi la botsalo - dinomore mo ditshwantshong le dikaratarontho - metshameko ya dikaratapalo - dinomore mo dipapatsong/ dipampitshana/ dikarata tsa botsalo - rejisetara ya botsenelo	Dirisa dinomore mo dikaelong tse di tlwaelegileng: - aterese, dinomore tsa mogala - dinomore mo ditshwantshong le dikaratarontho - metshameko ya dikaratapalo - dinomore mo dipapatsong/ dipampitshana/ dikarata tsa botsalo - rejisetara ya botsenelo
KGOPOLOPALO (DIKAMANO) **Tlhalosa, bapisa le go rulaganya dinomore**					
1.4	**Tlhaola le go tlhalosa dipalotlalo**	**Mofutapalo: 1–3** Tlhaola le go tlhalosa dipalotlalo go fitlha ka 1, 2, 3 o dirisa dikgobokanyo le matshwao (ntsi ka nngwe, nnye go; pele, morago, magareng) Mofutapalo: 1	**Mofutapalo: 1–5** Tlhaola le go tlhalosa dipalotlalo 4, 5 o dirisa dikgobokanyo le matshwao Boeletsa dinomore 1–3	**Mofutapalo: 1–8** Tlhaola le go tlhalosa dipalotlalo 6, 7, 8 o dirisa dikgobokanyo le matshwao Boeletsa dinomore 1–5 Mofutapalo: 1–7	**Mofutapalo: 0–10** Tlhaola le go tlhalosa dipalotlalo 0, 9, 10 Boeletsa dinomore 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

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
	Bapisa dinomore	Bapisa gore ke dikgobokanyo dife tse di neetsweng tse pedi tse di: - kgolo, nnye - kgolwane, nnyenyana - kgolo thata, nnye thata Rulaganya dikgobokanyo tse di fetang bobedi go tswa go nnye thata go ya go kgolo thata le go tswa go kgolo thata go ya go nnye thata Tse dinnye le tse mmalwa, sk. go opa diatla ka tshoganyetso, nako ya dijo, dirisa didiriswa mmogo	Bapisa gore ke dikgobokanyo dife tse di neetsweng tse pedi tse di: - kgolo, nnye - kgolwane, nnyenyane - kgolo thata, nnye thata Ntsi go, nnye go, lekana le Ntsi le mmalwa, sk. go opa diatla ka tshoganyetso	Ntsi go, nnye go, lekana le Ntsi le mmalwa Botsa dipotso: 'Ke dife tse dintsi thata/dinnye thata?'	Ntsi go, nnye go, lekana le Ntsi le mmalwa Botsa dipotso: 'Ke dife tse dintsi thata/dinnye thata?'
			Dira ditlhopha tse di lekanang (disete) tsa didiriswa, sk. bana kgotsa didiriswa mo phaposiborutelong	Dirisa didiriswa go dira ditlhopha tse di lekanang (disete)	Dirisa didiriswa go dira ditlhopha tse di lekanang (disete)
		Go tlhatlhamolola le go aga dikgobokanyo tsa 2 le 3, sk. 3 e ka nna: 1 le 1 le 1 KGOTSA 2 le 1 KGOTSA 1 le 2 KGOTSA lefela (noto) le 3	Go tlhatlhamolola le go aga dikgobokanyo tsa 4 le 5, sk. 4 e ka nna: 1 le 1 le 1 le 1 KGOTSA 3 le 1 KGOTSA 2 le 2 KGOTSA lefela (noto) le 4	Dirisa didiriswapalo go tlhotlhomisa le go tla ka ditogamaano tsa go tlhatlhamolola le go aga dikgobokanyo go fitlha ka 8	Dirisa didiriswapalo go tlhotlhomisa le go tla ka ditogamaano tsa go tlhatlhamolola le go aga dikgobokanyo go fitlha ka 10
	Go rulaganya (tatelano) dinomore	Rulaganya dikgobokanyo tsa didiriswa tse di neetsweng tse di fetang bobedi go tswa go nnye thata go ya go kgolo thata le go tswa go kgolo thata go ya go nnye thata	Rulaganya dikgobokanyo tsa didiriswa tse di neetsweng tse di fetang bobedi go tswa go nnye thata go ya go kgolo thata le go tswa go kgolo thata go ya go nnye thata	Rulaganya dikgobokanyo tsa didiriswa go tswa go nnye thata go ya go kgolo thata le go tswa go kgolo thata go ya go nnye thata	Rulaganya dikgobokanyo tsa didiriswa go tswa go nnye thata go ya go kgolo thata le go tswa go kgolo thata go ya go nnye thata Nyalanya karata ya letshwaopalo le dikgobokanyo
		Go rulaganya dinomore ka tshoganyetso 'Ke eng se se tlang pele, morago, mo magareng': - nomore/terata ya diaparo - molapalo kgotsa llere - dikaratapalo	Rulaganya matshwaopalo ka thulaganya e e nepagetseng ya go bala 'Ke eng se se tlang pele, morago, mo magareng': - nomore/terata ya diaparo - molapalo kgotsa llere - dikaratapalo	Rulaganya matshwaopalo ka thulaganya e e nepagetseng ya go bala 'Ke eng se se tlang pele, morago, mo magareng': - nomore/terata ya diaparo - molapalo kgotsa llere - dikaratapalo	Ka tshoganyetso: Mofutapalo: 0–10 Rulaganya matshwaopalo ka thulaganya e e nepagetseng ya go bala 'Ke eng se se tlang pele, morago, mo magareng': - nomore/terata ya diaparo - molapalo kgotsa llere - dikaratapalo

	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			

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
	Dipalokemotatelano	Ka tshoganyetso, dira temoso ka ga ntlha, bobedi, boraro … bofelo, e e latelang Itsise ka nako ya: - dilapolosi/nako ya dijo le dinako tsa ntlwanaboithusetso - mo dikaelong tsa letsatsi le letsatsi, go ralala dirutwa, mo meleng, sk. 'Ke mang wa ntlha/bofelo/ bobedi go tsena ka lebati'	Ka tshoganyetso, dira temoso ka ga ntlha, bobedi, boraro, bone, bofelo, e e latelang Mo dikaelong tsa letsatsi le letsatsi: ditlwaelo tsa letsatsi le letsatsi – mo meleng, nako ya dijo, dinako tsa ntlwanaboithusetso Lomaganya: Dikgono tsa Botshelo, kgolo ya mmele le ditirwana tsa botsweretshi (mo go maleba), ditirwana tsa kwa ntle, sk. ditso Tlhomaganya didiriswa kgotsa didiriswapalo mme lo buisanele maemo	Ka tshoganyetso, dira temoso ka ga ntlha, bobedi, boraro, bone, botlhano, bofelo, e e latelang Boeletsa dipalokemotatelano mo ditirong tsa letsatsi le letsatsi mme o e lomaganye mo letsatsing le mo ditirwaneng tsa letsatsi le letsatsi, sk. ditso Tlhomaganya barutwana le didiriswa mme o lemoge kemotatelano mo ntlheng e le nngwe, sk. molemeng go ya mojeng	Ka tshoganyetso, dira temoso ka ga ntlha, bobedi, boraro, bone, botlhano, borataro, bofelo, e e latelang Boeletsa dipalokemotatelano mo ditirong tsa letsatsi le letsatsi mme o e lomaganye mo letsatsing le mo ditirwaneng tsa letsatsi le letsatsi, sk. ditso Tlhomaganya barutwana le didiriswa mme o lemoge kemotatelano mo ntlheng e le nngwe, sk. molemeng go ya mojeng le mojeng go ya molemeng
1.5	**Bolengkemedi**	Ga go na diteng tsa PPKT ya Mophato R (tota mogopolopalo wa dipalo 1–9 le lefela, 1.1 le 1.4)			
RARABOLOLA DIPALO MO BOKAELONG					
1.6	**Malepa a go rarabolola dipalo**	**Mofutapalo: 1–3** Rarabolola dipalo mo bokaelong jwa letsatsi le letsatsi Dirisa malepa a a latelang: - didiriswa tse di bonalang, sk. dibadi - go bala tsotlhe ka bongwe	**Mofutapalo: 1–5** Rarabolola dipalo mo bokaelong jwa letsatsi le letsatsi Dirisa malepa a a latelang: - didiriswa tse di bonalang, sk. dibadi - melapalo e e tshegetswang ka didiriswa tse di kgongwang - dibaga tsa kago ya lesome - go bala tsotlhe ka bongwe Mofutapalo: 1–4	**Mofutapalo: 1–8** Rarabolola dipalo mo bokaelong jwa letsatsi le letsatsi Dirisa malepa a a latelang: - didiriswa tse di bonalang, sk. dibadi - melapalo e e tshegetswang ka didiriswa tse di kgongwang - dibaga tsa kago ya lesome - go bala tsotlhe ka bongwe - go tswelela go bala Mofutapalo: 1–7	**Mofutapalo: 0–10** Rarabolola dipalo mo bokaelong jwa letsatsi le letsatsi Dirisa malepa a a latelang: - didiriswa tse di bonalang, sk. dibadi - melapalo e e tshegetswang ka didiriswa tse di kgongwang - dibaga tsa kago ya lesome - go bala tsotlhe ka bongwe - go tswelela go bala Mofutapalo: 0–10
1.7	**Go tlhakanya le go ntsha** Rarabolola ka go balela kwa godimo dipalofoko mo tirisong le go tlhalosa tharabololo ya gago ya dipalo tse di akaretsang go tlhakanya le go ntsha ka dikarabo tse di fitlhang go 10	Tlhotlhomisa go tlhakanya le go ntsha mo ditirwaneng tsa letsatsi le letsatsi o dirisa didiriswapalo le dikanelo Rarabolola dipalo mo tirisong tse di akaretsang dinomore 1–3 o dirisa didiriswa, dikanelo, ditshwantsho	Rarabolola ka go balela kwa godimo dipalo mo tirisong tse di akaretsang dinomore 1–5 o dirisa didiriswa, dikanelo, ditshwantsho Dirisa dibadi mme o rarabolole dipalo tse di akaretsang dinomore 2, 3 le 4 Boeletsa tharabololo ya dipalo tse di akaretsang 1 go fitlha ka 4	Rarabolola ka go balela kwa godimo dipalo mo tirisong tse di akaretsang dinomore 1–8 o dirisa didiriswa, dikanelo, ditshwantsho Itsise mareo (tlhakanya go/tlhakanya, tseela kwa ntle/ntsha) Dirisa dibadi mme o rarabolole dipalo tse di akaretsang dinomore 5, 6 le 7 Boeletsa tharabololo ya dipalo tse di akaretsang 1 go fitlha ka 7	Rarabolola ka go balela kwa godimo dipalo mo tirisong tse di akaretsang dinomore 0–10 o dirisa didiriswa, dikanelo, ditshwantsho Dirisa mareo (tlhakanya le go ntsha) Dirisa dibadi mme o rarabolole dipalo tse di akaretsang dinomore 8, 9 le 10 Boeletsa tharabololo ya dipalo tse di akaretsang 1 go fitlha ka 10
1.8	**Tlhakanyopoeletso e e isang kwa go atiseng**	Ga go na diteng tsa PPKT ya Mophato R			

	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)			

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
1.9	Go kgobokanya le go kgaoganya go go isang kwa go aroleng (go kgaoganya go go lekanang le go kgobokanya ka dipalotlalo go fitlha ka 10 le dikarabo tse di akaretsang disala)	Itsise mogopolo wa go kgaoganya ka go lekana: - mo ditirwaneng tsa letsatsi le letsatsi - dikanelo le ditshwantsho - kgaoganyo ya nngwe ka nngwe	Kgaoganya ka go lekana: - mo ditirwaneng tsa letsatsi le letsatsi - dikanelo le ditshwantsho - kgaoganyo ya nngwe ka nngwe	Kgaoganya ka go lekana: - go kgobokanya - seripa/halofo - dirisa didiriswa tse di bonalang	Kgaoganya ka go lekana: - go kgobokanya - seripa/halofo le oketsa gabedi - dirisa didiriswa tse di bonalang
1.10	Kgaoganyo e e isang kwa dipalophatlong	Ga go na diteng tsa PPKT ya Mophato R (tota go rarabolola dipalo tse di nang le disala tse di ka kgaoganngwang, 1.9)			
1.11	Tšhelete		Godisa temogo ya tšhelete ya papetlana ya Aforikaborwa: 10c, 20c, 50c, R1, R2, R5 Lemoga mmala le diphologolo Lemoga ditshwano le dipharologano Rulaganya tšhelete ya go tshameka go ya ka mmala le bogolo Neela tšhelete ya go tshameka mo sekhutlong sa ntlo	Godisa temogo ya tšhelete ya dipampiri ya Aforikaborwa: R10, R20, R50, R100, R200 Lemoga ditshwano le dipharologano magareng ga tšhelete ya dipampiri Rulaganya tšhelete ya go tshameka go ya ka mmala le bogolo Neela tšhelete ya go tshameka mo sekhutlong sa ntlo	Neela tšhelete ya go tshameka mo sekhutlong sa ntlo
PALELO E E SENG MO TIRISONG: DITIRO					
1.12	Malepa	Ga go na diteng tsa PPKT ya Mophato R (tota go bala tsotlhe le go bala mo go 1.1 le 1.6)			
1.13	Go tlhakanya le go ntsha: rarabolola dipalo tse di boletsweng ka go tlhakanya le go ntsha		Mofutapalo: 1–5 Rarabolola ka go balela kwa godimo dipalo tsa go tlhakanya le go ntsha ka dikarabo tse di fitlhang go 5 Mofutapalo: 1–4	Mofutapalo: 1–8 Rarabolola ka go balela kwa godimo dipalo tsa go tlhakanya le go ntsha ka dikarabo tse di fitlhang go 8 Mofutapalo: 1–7	Mofutapalo: 1–10 Rarabolola ka go balela kwa godimo dipalo tsa go tlhakanya le go ntsha ka dikarabo tse di fitlhang go 10 Mofutapalo: 1–10
1.14	Tlhakanyopoeletso e e isang kwa go atiseng	Ga go na diteng tsa PPKT ya Mophato R			
1.15	Go arola	Ga go na diteng tsa PPKT ya Mophato R (tota go kgaoganya go go lekanang, 1.9)			
1.16	Dipalo tsa tlhogo	Simolola ditirwana tse di kaelwang ke morutabana mo phaposiborutelong ka dipalo tsa tlhogo mme o dire dipalo tsa tlhogo moo ditšhono tsa go ithuta ka tshoganyetso di runyang Go bala didiriwa tsa letsatsi le letsatsi Go balela kwa pele le kwa morago Go bala ka tatelano Go lekanyetsa Go rarabolola dipalo Metshameko ya kgakologelo			
1.17	Dipalophatlo	Ga go na diteng tsa PPKT ya Mophato R (tota go kgaoganya go go lekanang, 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. DIPATERONE, DITIRO LE ALEJIBORA					
	SETLHOGO	**KGWEDITHARO 1**	**KGWEDITHARO 2**	**KGWEDITHARO 3**	**KGWEDITHARO 4**
2.1 DIPATERONE TSA JEOMETERI					
Supa dipaterone		Supa dipaterone mo tikologong e e tlwaelegileng ya letsatsi le letsatsi, sk. diaparo, didiriswa le tikologo Lemoga 'poeletso' mo dipateroneng			
Kopolola le go atolosa dipaterone tse di bonolo tse di ipoeletsang o dirisa didiriswa tse di kgongwang le ditshwantsho		Kopolola o feleletse dipaterone Kopolola dipaterone o dirisa mmele jaaka seletswa Kopolola, feleletsa le go itlhamela dipaterone Tsenyeletsa puo: Go latelang? Go tlang pele? E tshwana jang? E farologana jang?	Kopolola le go atolosa dipaterone ka ditshwantsho Kopolola paterone e e neetsweng o dirisa tšhelete ya dipapetlana Tlhalosa poeletso mo dipateroneng Kopolola paterone e e neetsweng o dirisa didiriswa tse di tshwaregang tsa 3-D le dibopego tsa 2-D, dikhoene, dibaga, j.j.	Kopolola le go atolosa dipaterone ka ditshwantsho Kopolola dipaterone tse di tsepameng le tse di rapaletseng o dirisa didiriswa tse di kgongwang Atolosa dipaterone tse di bonolo mme di ipoeletsa	Kopolola le go atolosa dipaterone ka ditshwantsho Kopolola paterone ya modumo (modumo/kutlo) Dirisa didiriswa tse di tshwaregang le go rala dipaterone
Itlhamele dipaterone tse di ipoeletsang		Itlhamele paterone o dirisa didiriswa tse di kgongwang, dithalo, dipaterone tsa jeometeri Tlhalosa paterone ya gago (molao wa poeletso): - mmala o le mongwe, dibopego tse pedi - sebopego se le sengwe, mebala e mebedi	Itlhamele paterone ya gago ka ditshwantsho Tlhalosa paterone ya gago (molao wa poeletso): - mebala e mebedi, dibopego tse pedi - dibopego tse pedi, mebala e mebedi	Itlhamele paterone ya gago ka ditshwantsho Tlhalosa paterone ya gago (molao wa poeletso): - mebala e le meraro/ mene, sebopego se se farologaneng, j.j.	Itlhamele paterone Tlhalosa paterone ya gago (molao wa poeletso): - mebala e le meraro/ mene, sebopego se se farologaneng, j.j.
2.1	**Dipaterone tsa dipalo**	Ga go diteng tsa PPKT tsa Mophato R (tebelelo ya go bala: go rulaganya dinomore ka bonngwe le bopedi, 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. BOALO le POPEGO (JEOMETERI)					
	SETLHOGO	**KGWEDITHARO 1**	**KGWEDITHARO 2**	**KGWEDITHARO 3**	**KGWEDITHARO 4**
3.1	**Maemo, kitsiso le dipono** Tlhalosa selo se le sengwe sa tlhakoretharo le kamano ya sona le se sengwe (sekao, fa pele le fa morago)	Botsalano jwa boalo Maemo a ngwana go ya ka botsalano le tikologo Maemo a selo se le sengwe kgotsa go feta a amana le morutwana: - fa pele le fa morago ga - mo go, mo godimo, mo tlase, fa tlase - mo teng le kwa ntle, mo gare le kwa ntle - kwa godimo le kwa tlase - gaufi le mo gare	Botsalano jwa boalo Maemo a ngwana go ya ka botsalano le tikologo Maemo a selo se le sengwe kgotsa go feta a amana le morutwana: - mo le fa tlase - mo godimo ga le mo tlase - fa pele le fa morago ga	Botsalano jwa boalo Maemo a selo se le sengwe kgotsa go feta a amana le tse dingwe: - fa pele le fa morago ga - mo go, mo godimo, mo tlase, fa tlase - gaufi le - gare - molema le moja - tiro ya boto ya ditlhomelwa Tlhalosa dilo go tswa mo maphateng a a farologaneng, sk. mpopo, ntlo go tswa kwa pele, kwa morago, kwa thoko go tswa gore o eme kae	Botsalano jwa boalo Maemo a selo se le sengwe kgotsa go feta a amana le tse dingwe le barutwana ba amana le ba bangwe: - fa pele le fa morago ga - mo godimo ga, tlase, godimo, fa tlase - godimo le tlase - gaufi le, magareng le gare - molema le moja Maemo a selo se le sengwe kgotsa go feta a amana le tse dingwe
	Sala dikaelo morago (a le esi kgotsa e le tokololo ya setlhopha) go ipaya mo sebakeng se se kgethegileng (dikaelo)	Tshupokaelo – kwa pele le kwa morago Kwa godimo le kwa tlase Metshameko jaaka go batla terena Khoso ya dikgoreletsi – ba sala dikaelo morago Thutakatisommele le mmino	Tshupokaelo – kwa pele le kwa morago Khoso ya dikgoreletsi – go latela kaelo Ditirwana tsa kwa ntle Tiragalo: molema le moja	Kwa pele le kwa morago Tšhate ya motsutshupo Molema le moja	Kwa pele le kwa morago Kwa godimo le kwa tlase Go ya godimo le tlase Molema le moja Modumo o tlhaga kae?
3.2	**Didiriswa tsa 3-D *(dilo tsa ditlhakoreraro)***				
	Lemoga, tlhaola/ bontsha le go naya maina a dilo tsa matlhakoretharo mo phaposiborutelong	Itsise le go dirisa Bapisa le go rulaganya: - dikgwele - mabokoso ka difatla tsa khutlonne le tse di tlwalegileng (matlhakore)			

	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

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
	Tlhalosa, rulaganya le go bapisa dilo tsa tlhakoretharo (3-D)	Itsise Tšhate ya phepafatso (karoganyo ya ditshamekisi) Rulaganya dilo tsa 3-D go latela (ponagalo e le nngwe): - bogolo (kgolo/nnye) - mmala - popego Lemoga le go dirisa dilo tsa 3-D: sephaphathi, kgolokwe, sebopego sa khutlonne kgotsa khutlonnetsepa Dilo tse di kgokologang Dilo tse di relelang	Rulaganya dilo tsa 3-D go latela ditshwano le dipharologano: - bogolo - mmala - popego	Rulaganya dilo tsa 3-D go latela ditshwano le dipharologano (diponagalo tse pedi): - bogolo - mmala - popego Dirisa dilo tsa 3-D: sephaphathi, kgolokwe, sebopego sa khutlonne kgotsa khutlonnetsepa	Rulaganya dilo tsa 3-D go ya ka (diponagalo tse pedi kgotsa go feta): - bogolo - mmala - popego Dirisa dilo tsa 3-D: sephaphathi, kgolokwe, sebopego sa khutlonne kgotsa khutlonnetsepa
	Aga dilo tsa tlhakoretharo (3-D)	**Tsweletsa** Neela didirisiwa tse di agang diboloko le dikago ka nako ya motshameko o o lokologileng ka fa gare letsatsi lengwe le lengwe Aga ka diboloko	**Tsweletsa** Neela didirisiwa tse di agang diboloko le dikago ka nako ya motshameko o o lokologileng ka fa gare letsatsi lengwe le lengwe Aga ka diboloko Dirisa diboloko tsa kago le didiriswa tse di kileng tsa dirisiwa go ikagela dikago	**Tsweletsa** Neela didirisiwa tse di agang diboloko le dikago ka nako ya motshameko o o lokologileng ka fa gare letsatsi lengwe le lengwe Ikagele kago ka go kopisa sekao sa kago e e neetsweng Kopisa kago e e tswang mo karatatlhamong kgotsa karatatshwantshong	**Tsweletsa** Neela didirisiwa tse di agang diboloko le dikago ka nako ya motshameko o o lokologileng ka fa gare letsatsi lengwe le lengwe Tsweletsa ka nako ya motshameko o o lokologileng mo gare
3.3	**Dibopego tsa tlhakorepedi (2-D)**				
	Lemoga, tlhaola/ bontsha le go naya maina a dibopego tsa tlhakorepedi (2-D) mo phaposiborutelong	Itsise Tšhate ya phepafatso/Tšhate ya mothusi Lemoga letshwao le leina la morutwana Itsise dibopego tsa 2-D: sediko, khutlonne, khutlotharo, khutlonnetsepa Diphazele (bonnye dikarolwana di le thataro)	Lemoga letshwao le leina la morutwana Lemoga, tlhaola le go naya leina la dibopego tsa 2-D: sediko, khutlonne le khutlotharo Diphazele (bonnye dikarolwana di le 12)	Lemoga le go tlhaola leina la morutwana Boeletsa: sediko, khutlonne, khutlotharo Bapisa dikhutlonnetsepa le dikhutlonne Diphazele (bonnye dikarolwana di le 18)	Tlhaola leina la morutwana Boeletsa: khutlonnetsepa Lemoga, tlhaola le go naya dibopego tsa 2-D maina: sediko, khutlonne, khutlotharo, khutlonnetsepa Diphazele (bonnye dikarolwana di le 24)
	Tlhalosa, rulaganya le go bapisa dibopego tsa 2-D	Rulaganya dibopego tsa 2-D go ya ka: - mmala - popego Sediko: mola o o kgogoropo Khutlonne: matlhakore a 4, mela e e tlhamaletseng, dikhutlo Khutlotharo: matlhakore a 3, mela e e tlhamaletseng, dikhutlo	Rulaganya dibopego tsa 2-D go latela ditshwano le dipharologano: - popego Boeletsa khutlotharo Boeletsa sediko le khutlonne	Rulaganya dibopego tsa 2-D go ya ka: - mmala - sebopego (mola o o kgogoropo, mela e meraro kgotsa e mene) Boeletsa sediko, khutlonne le khutlotharo	Rulaganya dibopego tsa 2-D go ya ka: - bogolo - mmala - popego

	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)

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
	Popego e e fitlhegileng **Dipopego tsa jeometeri**	Itsise temogo ya popego e e fitlhegileng (lemoga didiriswa le dipbopego – 'Ke nna setlhodi ka matlho a me a mannye') Itsise sediko, khutlonne le khutlotharo	Boeletsa temogo ya popego e e fitlhegileng ka ditirwana tsa go rulaganya, go nyalanya go baya ka ditlhopha mmogo le go phepafatsa Boeletsa khutlotharo Poloko ya popego (dira tlhomamo ya khutlotharo)	Boeletsa temogo ya popego e e fitlhegileng ka ditirwana tsa go rulaganya, go nyalanya go baya ka ditlhopha mmogo le go phepafatsa Boeletsa khutlonne Poloko ya popego (dira tlhomamo ya dibopego tse di thutilweng go fitlha fa)	Boeletsa temogo ya popego e e fitlhegileng ka ditirwana tsa go rulaganya, go nyalanya go baya ka ditlhopha mmogo le go phepafatsa Boeletsa sediko, khutlotharo, khutlonne le khutlonnetsepa Poloko ya popego (dira tlhomamo ya dibopego tse di ithutilweng go fitlha fa)
3.4	**Tekano** **(Lemoga mola wa tekano mo go ena le mo tikologong ya gagwe)**	Tlhaola dikarolo tsa mmele Lemoga dikarolo tsa mmele go ya ka go re: - mmele wa motho o na le matlhakore a mabedi - letlhakore le lengwe, le letlhakore le lengwe, go isa kwa molemeng le mojeng - godimo/tlase - morago/pele - go kgabaganya molagare (ditirwana tse di diragadiwang) Ditirwana tse di diriwang ka nako ya kgodiso ya mmele – ka go dirisa merumo le dipina, le ka nako ya Botsweretshi jwa Boitlhamedi	Go kgabaganya molagare – ditiro tsa tiragatso Go diragatsa go kgabaganya molagare ka nako ya Dikgono tsa Botshelo (kgodiso ya Mmele) – ka go dirisa merumo le dipina le ka nako ya Botsweretshi jwa Boitlhamedi	Go diragatsa go kgabaganya molagare (ditirwana tsa patitšhoko) Go diragatsa go kgabaganya molagare ka nako ya Dikgono tsa Botshelo (kgodiso ya mmele)	Go nna le temogo ya go re go na le tekano mo dibopegong Go diragatsa go kgabaganya molagare ka nako ya Dikgono tsa Botshelo (kgodiso ya mmele)

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. TEKANYO					
	SETLHOGO	**KGWEDITHARO 1**	**KGWEDITHARO 2**	**KGWEDITHARO 3**	**KGWEDITHARO 4**
4.1	**Nako**	Itsise dikgopolo ka bobedi motshegare/ bosigo, lesedi/ lefifi, mo mosong/thapama/ bosigo (bosigo jwa gompieno) Itsise **lenaneo la letsatsi le letsatsi** ka ditshwantsho go tswa molemeng go ya mojeng le motsu go supa ditirwana fa letsatsi le tswelela Itsise **tshate ya maemo a bosa** (letsatsi le letsatsi) le na le leina la letsatsi, letlha le kgwedi ka pina le morumo, dikarata tsa dipontsho le matshwao le ditshwantsho mo alemanakeng ya beke **Malatsi a beke** (letsatsi le letsatsi) tatelano e e ithutilweng ka go opela pina kgotsa morumo Supa malatsi a botsalo, go tswa, malatsi a a kgethegileng, malatsi a boikhutso mo gare ga beke Latedisa dikgwedi tsa ngwaga ka go opela pina Go godisa temogo ya mogopolo wa nako Itsise **tshate ya ditlha tsa ngwaga** selemo, letlhafula, mariga, dikgakologo Itsise **tshate ya malatsi a botsalo** le dingwaga, letlha la botsalo (letsatsi le kgwedi) Go godisa temogo ya kaelo ya go buisa	**Lenaneo la letsatsi le letsatsi** (tsweletso) Boeletsa tatelano ya ditiragalo tse di ipoeletsang mo letsatsing le le lengwe **Tshate ya maemo a bosa** (letsatsi le letsatsi) e na le letsatsi, letlha, le pina ya kgwedi le morumo, dikarata tsa pontsho le matshwao a a bontshang, matshwao le ditshwantsho mo alemanakeng ya beke le beke **Malatsi a beke** (tsweletso) boeletsa pina kgotsa morumo letsatsi le letsatsi Lemoga gore morutwana o dirang fa a tsoga go fitlhelela a ya sekolong Lemoga gore go diragalang magareng ga nako ya dilalelo le ya go robala **Tshate ya malatsi a botsalo** e a tswelela fa morutwana a na le letsatsi la botsalo **Tshate ya ditlha tsa ngwaga** selemo, letlhabula, mariga, dikgakologo	**Lenaneo la letsatsi le letsatsi** (tsweletso) Boeletsa tatelano ya ditiragalo tse di ipoeletsang mo letsatsing le le lengwe **Tshate ya maemo a bosa** (letsatsi le letsatsi) e na le letsatsi, letlha, le pina ya kgwedi le morumo, dikarata tsa pontsho le matshwao a a bontshang, matshwao le ditshwantsho mo alemanakeng ya beke le beke **Malatsi a beke** (tsweletso) **Tshate ya ditlha tsa ngwaga** (tsweletso) **Tshate ya malatsi a botsalo** e a tswelela fa morutwana a na le letsatsi la botsalo	**Lenaneo la letsatsi le letsatsi** (tsweletso) Boeletsa tatelano ya ditiragalo tse di ipoeletsang mo letsatsing le le lengwe **Tshate ya maemo a bosa** (letsatsi le letsatsi) e na le letsatsi, letlha, le pina ya kgwedi le morumo, dikarata tsa pontsho le matshwao a a bontshang, matshwao le ditshwantsho mo alemanakeng ya beke le beke **Malatsi a beke** (tsweletso) **Tshate ya ditlha tsa ngwaga** (tsweletso) **Tshate ya malatsi a botsalo** e a tswelela fa morutwana a na le letsatsi la botsalo

	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			

	SETLHOGO	KGWEDITHARO 1	KGWEDITHARO 2	KGWEDITHARO 3	KGWEDITHARO 4
4.2	**Boleele** Bapisa/ tshwantshanya le go rulaganya didiriswa o dirisa tlotlofoko e e maleba go tlhalosa boleele	Ka nako ya ditiro tsa letsatsi le letsatsi itsise mogopolo wa boleele: telele le khutshwane, telele ka seemo, telejana ka seemo le telele go gaisa Itsise tšhate ya bogodimo Barutwana ba ka bapisa bogodimo jwa bona le sengwe mo phaposing, sk. khaboto: - go lekanyetsa ka diatla (ka pono le ka tshoganyetso) - go lekanyetsa ka go dirisa dikgato/dinao	Ka nako ya ditiro tsa letsatsi le letsatsi tlhotlhomisa mogopolo wa boleele: telele le khutshwane, leele, leelenyana le leele go gaisa Bapisa le go rulaganya dilo tse pedi kgotsa go feta ka go di bapisa Dirisa tlotlofoko e e maleba go tlhalosa boleele: boleele go gaisa le bokhutshwakhutshwane, leelenyana le khutshwanyane Tšhate ya go lekanyetsa bogodimo: barutwana ba lemoga gore a ba godile fa go bapisiwa le kgweditharo e e fetileng	Lekanyetsa boleele jwa didiriswa tse di farologaneng Fopholetsa le go lekanyetsa boleele jwa dilo tse di farologaneng ba dirisa dinao/dikgato, diatla, mogala, thupana Tšhate ya go lekanyetsa bogodimo: barutwana ba lemoga gore a ba godile fa go bapisiwa le kgweditharo e e fetileng	Lekanyetsa bogodimo jwa barutwana ka go dirisa theipi ya go lekanyetsa Tšhate ya go lekanyetsa bogodimo: Barutwana ba lemoga gore a ba godile fa go bapisiwa le kgweditharo e e fetileng
4.3	**Boima** Bapisa/ tshwantshanya le go rulaganya didiriswa o dirisa tlotlofoko e e maleba	Go ithuta ka tshoganyetso mo teng le kwa ntle Go a tswelela ka nako ya motshameko wa metsi le motlhaba	Go ithuta ka tshoganyetso mo teng le kwa ntle Go a tswelela ka nako ya motshameko wa metsi le motlhaba	Itsise mogopolo wa boima ka go bapisa boima jwa dilo tse di farologaneng: - botlhofo/bokete - botlhošwana/ boketenyana - botlhofo thata/ bokete thata	Boeletsa puo ya boima ka nako ya ditirwana tsa ka fa teng le tsa kwa ntle
4.4	**Mothamo/Volumo** Bapisa/ tshwantshanya le go rulaganya didiriswa o dirisa tlotlofoko e e maleba	Go ithuta ka tshoganyetso mo teng le kwa ntle: lolea/ tletse, ntsi go, nnye go Go a tswelela ka nako ya motshameko wa metsi le motlhaba	Go ithuta ka tshoganyetso ditirwana tsa mo teng le kwa ntle Motshameko wa metsi/ motlhaba Dirisa ditshodi go bapisa bokaakang ka go dirisa ditshodi tse di tlwaelegileng	Itsise mogopolo wa go lekanya ga mothamo ka go bapisa gore mefuta ya ditshodi e tshola go le kae: - lolea/tletse - ntsi go/nnye go	Go a tswelela ka nako ya motshameko wa metsi le motlhaba Boeletsa puo ya mothamo/volumo ka nako ya ditirwana tsa ka fa teng le kwa ntle
4.5	**Sekgalatikologo le boatlhamo**	Ga go na diteng tsa PPKT ya Mophato R			

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. GO RANOLA TSHEDIMOSETSO					
	SETLHOGO	**KGWEDITHARO 1**	**KGWEDITHARO 2**	**KGWEDITHARO 3**	**KGWEDITHARO 4**
5.1	**Kgobokanya le go rulaganya didiriswa** Kgobokanya le go rulaganya didiriswa tse di tshwaregang go ya ka ponagalo e le nngwe, sk. bogolo jwa matlhare	Itsise mogopolo wa go ranola tshedimosetso: - kgobokanya le go rulaganya dinewa, sk. Go na le basimane/basetsana ba le kae mo phaposiboruteleng? - rulaganya dinewa ka go letla barutwana go ema mo moleng wa basimane/ basetsana	Kgobokanya didiriswa (dikalana tsa bogolo/ boleele jo bo farologaneng) Rulaganya didiriswa tse di kgokantsweng (dikalana)	Botsa potso: 'A maina a ditlhaka tse thataro a itsege thata?' Kgobokanya dinewa go araba potso o dirisa dikaratina tsa barutwana Rulaganya dikarataina go ya ka palo ya ditlhaka mo leineng lengwe le lengwe	Kgobokanya dinewa: Malatsi a bomang a botsalo a mo kholomong efe? Rulaganya dinewa go ya ka kgwedi e e maleba ya botsalo jwa morutwana mongwe le mongwe Kgobokanya dinewa: sk. O rata mmala ofe wa tege? Tlhopa boloko e le nngwe go emela mmala wa tlhopho ya gagwe ya tege mo bekeng Kgobokanya dinewa: Barutwana ba dirisa mofuta ofe wa sepalangwa go tla sekolong? Rulaganya dinewa tse di kokoantsweng (ba tla ka dinao, ka koloi ya batsadi, thekesi kgotsa bese)
5.2	**Tlhagisa didiriswa tse di kokoantsweng le go rulaganngwa**	Tshwantsha kerafo o dirisa didiriswa tse di bonalang Tshwantsha kerafo e e nang le tshedimosetso o dirisa diboloko kgotsa dipopego Dira kerafotshwantsho	Thala/Tshwantsha kerafo go bontsha tshedimosetso (kalana) Thala setshwantsho jaaka rekoto ya didiriswa tse di kgobokantsweng	Thala kerafo ka go kgomaretsa karataina e nngwe le e nngwe ka fa tlase ga kholomo e e maleba Dira kerafotshwantsho	Thala/Tshwantsha kerafo e e bontshang malatsi a botsalo jwa barutwana mo kgweding nngwe le nngwe Dirisa didiriswa tsa nnete go dira kerafo jaaka diboloko go emela mmala wa tege ya go tshameka e o akanyang go e dira, sk. botala jwa legodimo, serolwana, botala jwa tlhaga Thala kerafo ya ditshwantsho e e bontshang barutwana ba ba tlang ka dinao, le ba ba tlang ka thekesi, koloi, bese
5.3	**Buisanaela le go bega ka ga didiriswa tse di kokoantsweng le go rulaganngwa**	Buisa o be o ranole tshedimosetso ka go dirisa tege ya go tshameka go emela dipalo tsa basimane le basetsana mo phaposing Araba dipotso o ikaegile ka thulaganyodidiriswa ya gago O takile matlhare a magolo a le kae? Ke afe a mantsi: matlhare a makgolo kgotsa a mannye? Ke a makae/a mantsi/a mannye/a a lekanang?	Buisa le go ranola dikerafo ka go dirisa dipotso Araba dipotso o ikaegile ka setshwantsho sa gago kgotsa thulaganyodidiriswa ya gago	Buisa le go ranola dinewa ka go bala palo ya dikarataina mo kholomong e nngwe le e nngwe le go tla mo bokhutlong	Buisa le go ranola dikerafo o dirisa dipotso go bona gore ke kgwedi efe e e nang le bontsi jwa malatsi a botsalo Go ya ka tlhopho ya barutwana, mmala wa tege ya go tshameka mo bekeng e tlaa nna, sekao, serolwana Buisa le go ranola dikerafo (Ke ba le kae ba tlang ka dinao, ka thekesi, bese, j.j.?)

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

Dinomore, Ditiro le Dikamano

Go tlhaloganya nomore

Bana ba nna le go tlhaloganya palo le go bala ka maitemogelo a bona a letsatsi le letsatsi. Ba a dirisa go simolola go dira dikgolaganyo magareng ga dikao tse di farologaneng tsa dinomore. Ba lemoga gore dipalo di ka dirisiwa ka ditsela tse di farologaneng mo maemong a a farologaneng. Sekao, 'tlhano' e ka dirisiwa:

- go tlhagisa bokaakang ('go le go kana kang'): 'Ke na le dimonamone di le tlhano.'
- go tlhagisa tatelano ya dilo: 'Ke motho wa botlhano mo moleng.'
- jaaka go lekanya: 'O na le dingwaga di le tlhano.'
- jaaka letshwao: 'Re nna kwa nomoreng ya botlhano.'
- mo palelong: '2 + 3 = 5'

Dinomore ke dikakanyo kgotsa megopolo (go le go kana kang). Barutwana ba simolola go tlhaloganya gore 'tlhano' e kaya gore go na le botlhano jwa sengwe, le go re tlhano e ka nna maemo a botlhano mo moleng, kgotsa 'tlhano' e ka re bolelela gore go dilo di le kae. Dinomore di tlhaeletsa tshedimosetso e e rileng e e tletseng ka ga dikokoanyo le dilekanyo tsa dilo, ditiragalo le ditiragatso.

Setshwantsho 42 Bokao jo bo farologaneng jwa 'tlhano'

Dinomore ke megopolo e e sa bonaleng. Tsona ga se dilo ka botsona. Di tlhalosa sengwe ka ga dilo tse dingwe. Sekao, fela jaaka lefoko 'tala' le ka dirisiwa go tlhalosa mmala wa apole, nomore 'thataro' e ka dirisiwa go tlhalosa palo ya diapole mo kokoanyong. Fa mongwe a go kopa go ba neela poleite o ka ba neela selo se se bonalang, fela fa mongwe a go kopa go ba neela 'tlhano' ga o ka ke wa kgona go e ba neela.

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.

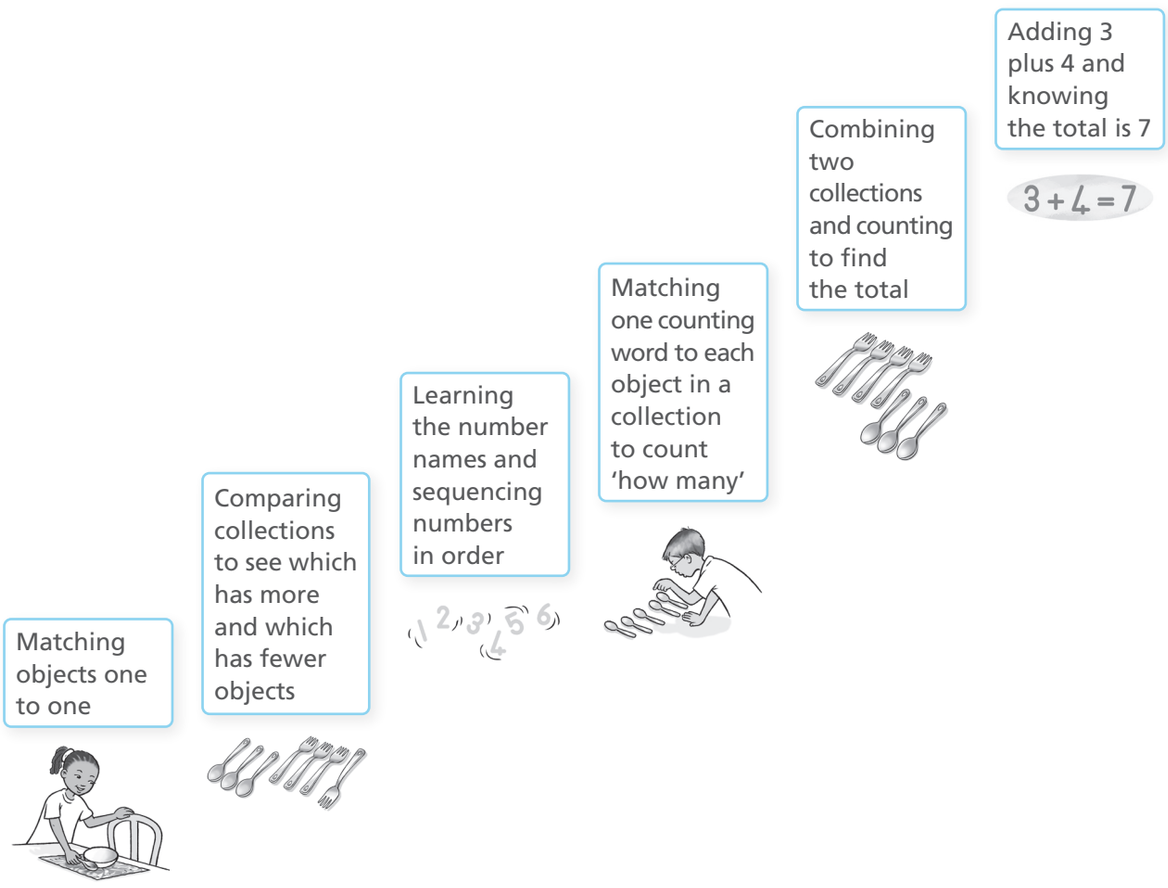


Figure 43 Progression

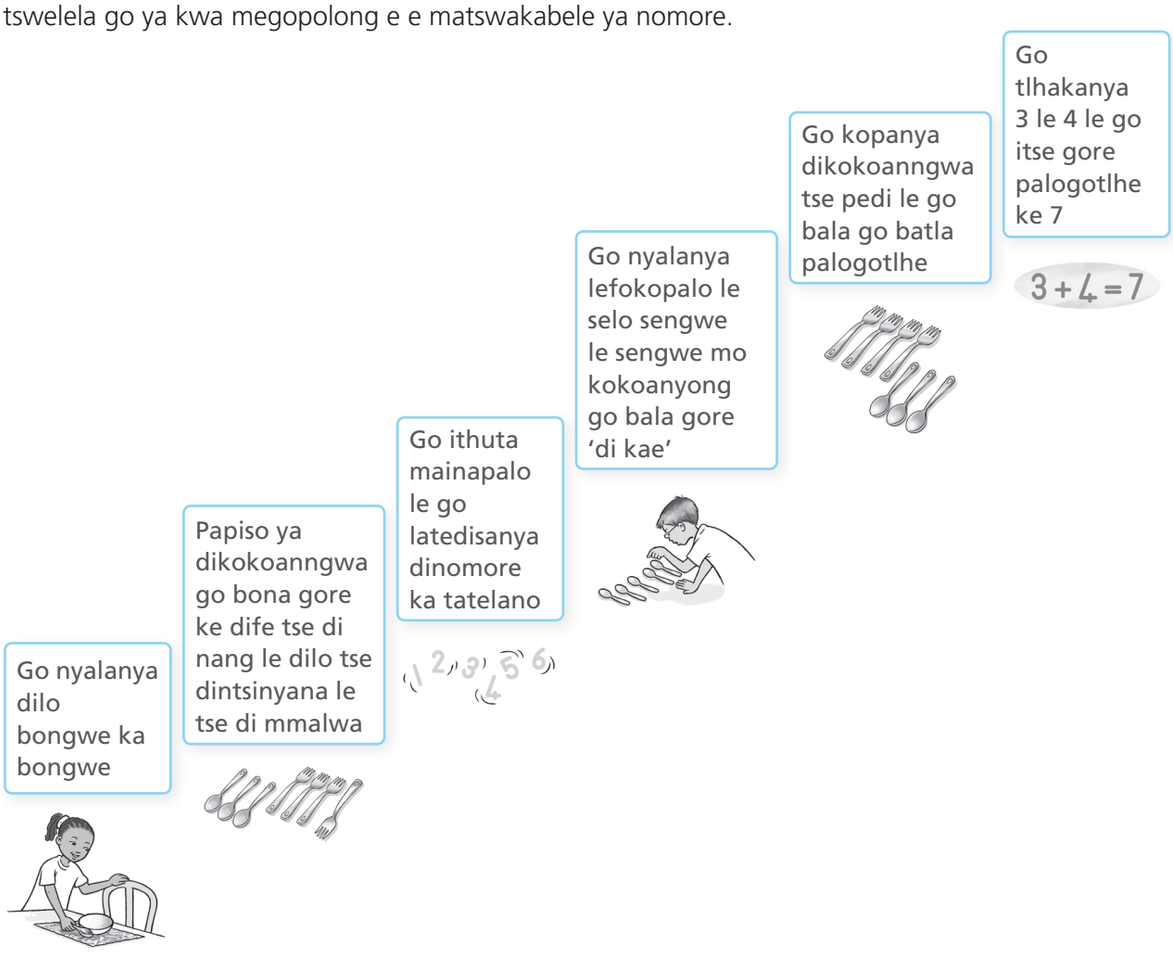
O ka akanya go ba neela palo '5' e kwadilwe mo karateng kgotsa o ka ba neela dikotana di le tlhano, kgotsa wa ba bontsha menwana e metlhano. Ga go kgonagale go bontsha nomore ka boyona ka gobo ke kakanyo e e mo ditlhogong tsa rona, ka jalo re batla ditsela ka go e bontsha kgotsa go e tlhagisa, jaaka go dirisa kokoanyo ya dilo, setshwantsho kgotsa letshwao le le tshwanang le palo kgotsa lefoko.

Ka go ikatisa ...

Thusa barutwana go aga kitso le megopolo e mešwa ya dipalo mo maitemogelong a bona a letsatsi le letsatsi:

- Dirisa maitemogelo a pele a barutwana fa o tlhagisa megopolo e mešwa ya dipalo.
- Dirisa maemo a a kgonagalang go diragatsa megopolo e mešwa ya dipalo.
- Dira dikgolagano magareng ga ditirwana le megopolo ya letsatsi le letsatsi.
- Rulaganya ditirwana tse di agelelang le go tiisa go tlhaloganya ga barutwana ga mogopolo wa dipalo.

Setshwantsho 43 se supa tswelelopele e e bonolo go tswa kwa ditirwaneng tsa letsatsi le letsatsi go ya kwa megopolong e e matswakabele ya nomore mo Mophato R. Se simolola ka ditirwana tsa letsatsi le letsatsi tse di nang le dikgolagano le dinomore le megopolo ya tshimologo ya dinomore mme e tswelela go ya kwa megopolong e e matswakabele ya nomore.



Setshwantsho 43 Tswelelopele

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.

Go tshwantsha nomore

Mo Mophatong wa R, barutwana ba dirisa matshwao go **tshwantsha** mafoko, ditshwantsho le dikakanyo. Bana ba ithuta pele go tshwantsha dikakanyo kgotsa ditiragatso ka go dirisa motshameko wa keletso, sekao, matsogo a morutwana ke diphuka tsa sefofane fa a ntse a dikologa mo pbhaposing, kgotsa morutwana a ka dirisa sekhurumelo sa polasetiki jaaka leotwana la go kgweetsa koloi.

LENAANEFOKO

tshwantsha
go dirisa dilo, matshwao kgotsa ditiragatso go emela kakanyo kgotsa kgopolo

Barutwana ba simolola go tshwantsha dinomore ba dirisa menwana mme ba tswelele ka go dirisa ditsela tse dingwe jaaka dilo, dithalo, ditshwantsho kgotsa matshwao. Barutwana ba tswelela pele:

- go tswa mo tirisong ya dilo tse di tshwaregang go tshwantsha dinomore, sk. disirilamunu, dimonamone, diphensele, matlhare
- go ya mo tirisong ya ditshwantshong kgotsa dithalong go tshwantsha dilo, sk. sethalo sa sirilamunu, motho, koloi
- go ya mo tirisong ya dibadi go tshwantsha dilo kgotsa ditshwantsho, sk. didisiki tsa polasetiki go bontsha palo ya disirilamunu
- go ya mo tirisongmatshwao go tshwantsha dilo tse di bonalang le ditshwantsho, sk. didiko, marontho, matshwao a a lekalekanang
- go ya mo tirisong ya matshwaopalo a a kwadilweng le mafokopalo, sk. '2' kgotsa 'pedi'.

Ditsela tse di farologaneng go supa 'tlhano' ke tseno di a latela.

Setshwantsho 44 Tlhagiso e e farologaneng ya 'tlhano'

Mefuta e e farologaneng ya dinomore

Go na le mefuta e e farologaneng ya nomore mo thulaganyopalong.
Mo Mophato R re tota fela go tlhaloganya le go dirisa dipalotlalo (dinomore tsa go bala).

Mo mephatong e e kwa godingwana, barutwana ba tlaa ithuta go re:

- **dipalotlalo** di akaretsa dipalo tse di tletseng le dipalokganetso
- **dipalo tse di utlwagalang** di akaretsa dipalotlalo, dipalokganetso, didesimale le dipalophatlo.

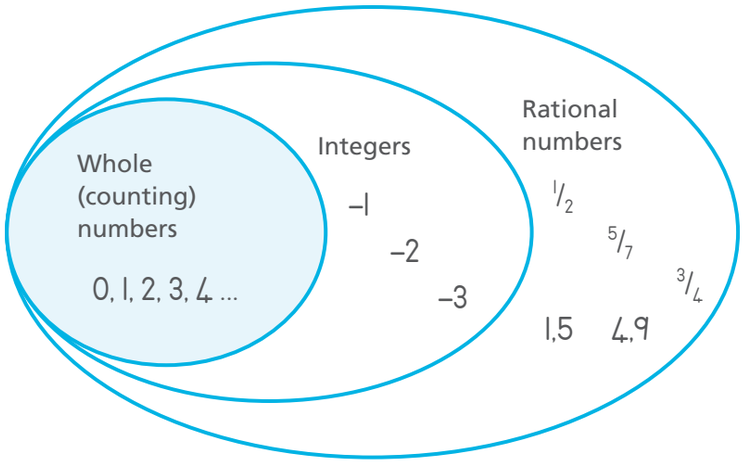


Figure 4.5 In Grade R the focus is on whole numbers.

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.

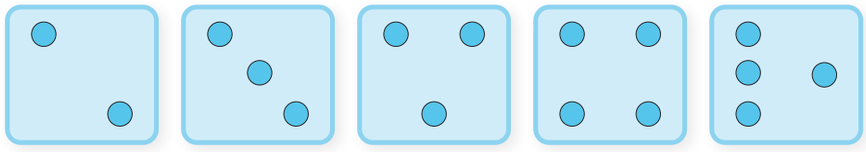
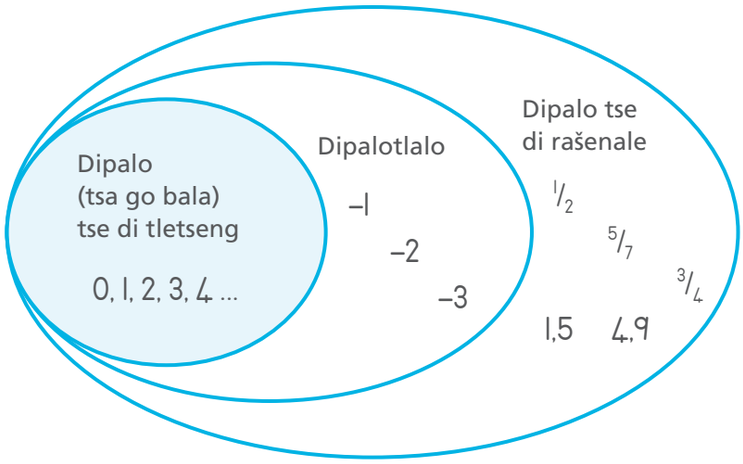


Figure 4.6 Dot arrangements for two, three and four

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.



Setshwantsho 45 Mo Mophato R go totilwe dipalotlalo.

Go sekena

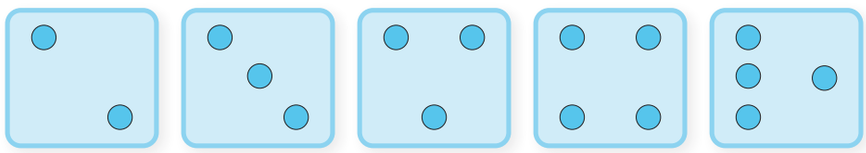
Go sekena go akaretsa go lemoga ka gangwe, ntle le go bala, palo ya dilwana tse di kokoantsweng. Go sekena ke kgono ya pele e e saleng e le gona pele ga go ithuta ka mainapalo le matshwao kgotsa go ithuta go bala. Go sekena go aga motheo o o popota wa go bala dilo tse di kokoantsweng le go balela go sale gale.

LENAANEFOKO

go sekena
bokgoni jwa go nna le tlhaloganyo ya go lemoga palogotlhe ya dilo mo go tse di kokoantsweng ntle le go di bala

Go tlhaloganya go sekena

Go tlhaloganya go sekena ke bokgoni jwa go lemoga ka gangwe palo ya dilwana tse di kokoantsweng. Bana ba bannye ba kgona go tlhaloganya kgotsa go lemoga pharologanyo magareng ga palo ya dilo tse di kokoantsweng, ntle le go di bala, mme e bile ba kgona go kaya gore ke dife tse dintsinyana kgotsa tse di mmalwa ntle le go itse mainapalo kgotsa matshwao. Gangwe le gape, ba kgona go dirisa menwana go nyalanya le go bontsha palo e e tshwanang ya dilo. Ka iketlo ba ithuta go nyalanya mafokopalo le dikokoanngwa mme e bile ba kgona go re ntle le go bala ba re mo dilong tse di kokoantsweng go na le se le sengwe, di le tharo, di le tlhano. Mokgwa o wa go sekena o kgonagala fela ka palo e nnye ya dilo mme bana ba le bantsi le bagodi ba ka dira seno ka nepo go fitlha mo go tlhano.



Setshwantsho 46 Thulaganyo ya marontho a mabedi, mararo le a le mane

Go tlhaloganya go sekena

Mo Mophato R bokgoni jwa barutwana go lemoga 'bokaakang' jwa dilo mo kokoanyong bo a oketesega. Bo ka atologela go bokaakang jo bo fetang tlhano ka go dirisa ditshwantshopalo tse di tshwanang le thulaganyo ya marontho mo letaeseng, didominong le diforeiming di le lesome.

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

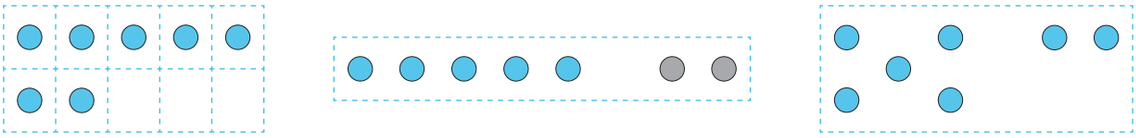


Figure 47 Dot arrangements for seven

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.

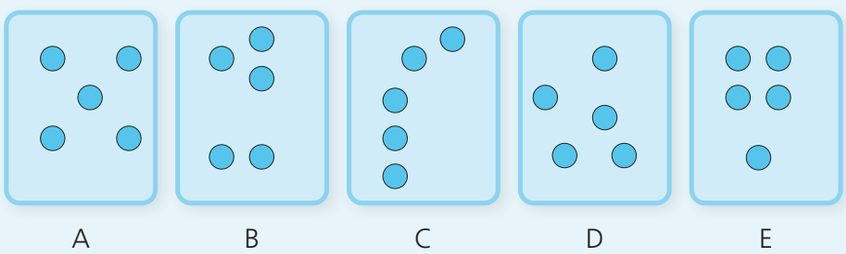


Figure 48 Dot cards

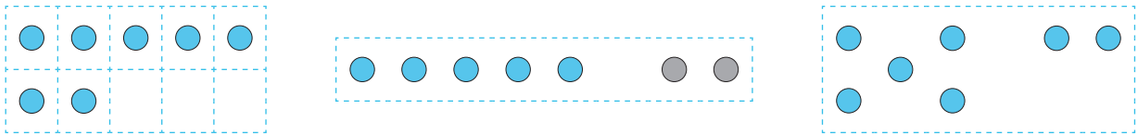
Activities such as dominoes and dice games provide fun opportunities to practise subitising skills.

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'.

Mo dikaong tse di fa tlase, ka go dirisa go tlhaloganya go sekena barutwana ka gangwe ba ka lemoga gore dikarata tseno di bontsha dilo di le tlhano ka bongwe ka bongwe.



Setshwantsho 47 Thulaganyo ya marontho mo go supa

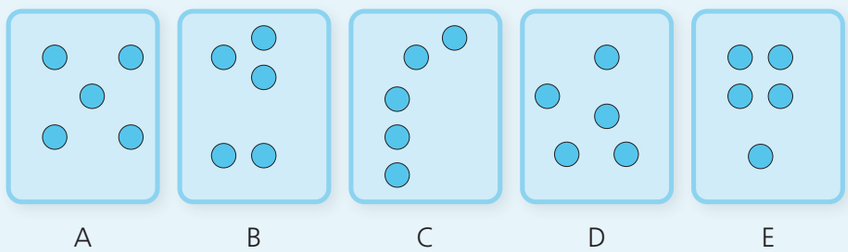
Mofuta ono wa katoloso ya go sekena o bidiwa go tlhaloganya go sekena. Go ikaegile ka kitso ya karolotlalo mme go kgontsha barutwana go lemoga ka bonako dinomore tse di fetang tlhano.

Ka go ikatisa ...

Barutwana ba itumelela go tshameka metshameko e e bontshang palo e nnye ya dilo ka bonako pele ga di fitlhiwa, mme ba bodiwe gore di ne di le kae. Metshameko ya go nyalanya le go bala e tlaa tsolotanya go sekena, sekao, go lemoga palo ya dilo ntle le go di bala. Seno se tlaa thusa barutwana ka go tshwarelela kopanyo ya dinomore go fitlha ka lesome le palelo ya go sale gale (go tlhakanya le go ntsha).

Dikaratarontho di ka dirisiwa go:

- tlhagisa thulaganyo e e farologaneng ya dinomore go simolola ka nngwe go fitlha ka tlhano
- tshegetsa kgolo ya temogo ya dinomore tse dinnye
- tsalanya mainapalo le dikokoanyo tse dinnye
- nyalanya dibadi le marontho.



Setshwantsho 48 Dikaratarontho

Ditirwana tse di tshwanang le metshameko ya didomino le mataese di tlamela ka ditšhono tse di itumedisang go katisa dikgono tsa go sekena.

Go bala

Go bala ke kgono e e matswakabele e e tlhokang ikatiso e e tseneletseng. Barutwana ba nna le kgono eno fa ba ntse ba bala dilo tse di bonalang. Go le gantsi ba simolola ka go etsisa barutwana kana bagodi fa ba bala.

Go na le ditirwana tse pedi tsa go bala. Ya ntlha ke ya go balela kwa godimo kgotsa ka tatelano go go akaretsang go tshwarelela maina le thulaganyo ya go bala dinomore, go le gantsi mo morumong kgotsa mo pineng. Ya bobedi ke go bala dilo bongwe ka bongwe go tlhola gore 'di kae'.

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.

Go balela kwa godimo

Mo Mophato R, barutwana ba ithuta thulaganyo e e nepagetseng ya mainapalo le go boeletsa tatelano letsatsi le letsatsi, ba balela kwa godimo. Mofuta ono wa **go balela kwa godimo** gape o bidiwa **go bala ka tatelano** kgotsa **palelogodimo**. Maitlhomo a go balela kwa godimo ke go thusa barutwana go tlhaloganya gore fa re bala go na le thulaganyo ya sete ya mainapalo, e e simololang mo go nngwe, e latelwe ke pedi, tharo, nne. Kwa tshimologong, barutwana ga ba tlhaloganye bokao jwa mainapalo ka botlalo mme ba ka tlola dinomore mo go baleng ka tatelano.

Go opela morumo kgotsa tlhatlhamano ya dinomore ka go di buela godimo go kaya poeletso ya dinomore go tswa mo kgopolong. Lefa barutwana ba bala ka dikgato tsa pedi, tlhano le lesome ba dirisa kitso ya bona ya thulaganyo eno ya dinomore. Go ithuta mainapalo le go a boeletsa ka thulaganyo e e nepagetseng ga go kaye gore barutwana ba itse go bala. Seno se farologane le go bala o batla go itse gore 'di kae'.

LENAANEFOKO

go balela kwa godimo/go bala ka tatelano/ palelogodimo
go balela kwa godimo, o bala dinomore ka thulaganyo e e nepagetseng

go balela diphitlhelelo/go balela dipoelo
go bala dilo go batla gore 'di kae'

Go bala dilo

Go bala dilo gape go bidiwa **go balela diphitlhelelo** kgotsa **go balela dipoelo**. Seno se kaya gore dilo kgotsa ditiragalo di nyalanngwa le mainapalo. Go bala gore 'dilo di kae', barutwana ba tlhoka go lemoga gore selo sengwe le sengwe mo kokoanyong se bona leinapalo ('nngwe, pedi, tharo, nne …') le gore o bala selo sengwe le sengwe gangwe.

Ka ditirwana tsa go dira le tsa kaelo ka morutabana, barutwana ba simolola go tlhaloganya le go diragatsa melawana e e latelang ya go bala:

1. **Molawana wa tsamaelano ya nngwe ka nngwe:** Go nyalanya nngwe, nngwe fela, lefokopalo go selo sengwe le sengwe mo kokoanyong fa e balwa. Kwa tshimologong barutwana ba ka bala selo se le sengwe gabedi, ba ka se tlola kgotsa ba lebala gore ke dlio dife tse di iseng di balweng. Go ka tswela barutwana mosola go kgoma le go sutisa dilo fa ba di bala.
2. **Molawana wa thulaganyo e e tlhomameng:** Mainapalo ka gale a rulagantswe ka thulaganyo e e tshwanang e bile e tsepame, sk. nngwe e latelwa ke pedi, pedi e latelwa ke tharo, tharo e latelwa ke nne, jalo jalo.
3. **Molawana wa khadinale:** Leinapalo la bofelo le le builweng fa go balwa dikokoanngwa, le emela palogotlhe ya dipalo mo kokoanyong.
4. **Molawana wa maitlhomo:** Barutwana ba tlhaloganya gore le fa ditlhopha tse di tshwanang ka palo ya dilo di lebega di farologane (sk. diterebe di le tlhano, batho ba le batlhano, dintlo di le tlhano) di na le palo e e tshwanang, k.g.r. 'botlhano'. Ba lemoga gore go bala go ka diragatswa mo dilong, ditshwantshong, mebaleng, dibopegong, kgotsa le ditiragatso kgotsa medumo.
5. **Molawana wa tatelano e e sa tsepamang:** Thulaganyo ya go bala dilo mo kokoanyong ga e botlhokwa. Barutwana ba tlhoka go tlhaloganya gore go sa kgathalasege gore re rulaganyang dilo jang, palogotlhe ya dilo mo kokoanyong e a tshwana.

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.

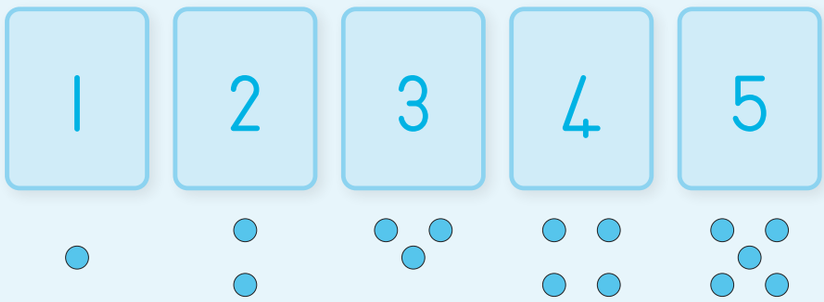


Figure 50 Counters represent number quantities in order.

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.

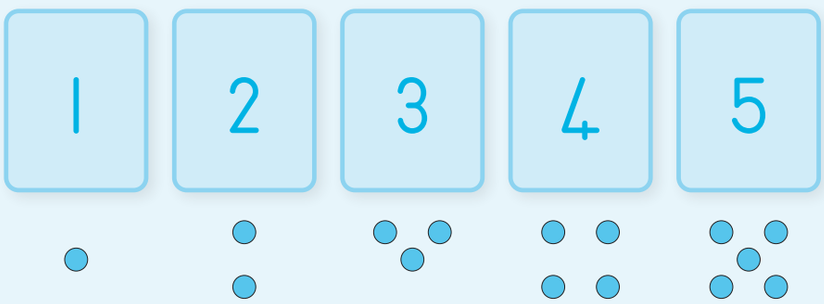
Setshwantsho 49 Sekao sa molawana wa matshwaopharologano

Fa barutwana ba tlhalogantse mme e bile ba ka diragatsa melawana yotlhe ya go bala ka botlhano jwa yona, re ka re ba itse go bala kwa ntle le pelaelo.

Ka go ikatisa ...

Ka go ikatisa, barutwana ba tlhaloganya gore go bala go ka dirisiwa go bapisa kokoanyo ya dilo. Fa barutwana ba itse tatelano ya go bala kgotsa thulaganyo ya dinomore tsa go bala ba:

- simolola go tlhaloganya gore nomore e nngwe le e nngwe mo tatelanong ya go bala e feta nomore e e tlang pele ka nngwe le gore e nnye go e e latelang ka nngwe.
- bapisa mo tlhogong dipalo le go bona gore pedi e feta nngwe ka nngwe, le gore tharo e feta pedi ka nngwe.
- lemoga gore dinomore di gola ka nngwe mo nakong e nngwe le e nngwe le gore nomore e nngwe le e nngwe mo tatelanong ya go bala e feta e e fetileng ka nngwe.



Setshwantsho 50 Dibadi di emela dilekanyonomore ka tatelano.

Tekanyetso

Le fa go bala e le ka ga go batla palo e e tshwanang ya dilo mo kokoanyong, barutwana gape ba tlhoka go nna le dikgono tsa tekanyetso gore ba kgone go re 'bo kana ka' ba dilo tse di leng mo kokoanyong. Ba tlhoka go kgona go dirisa mareo a a tshwanang le 'bontsi', 'mmalwa', 'feta', 'dintsi thata' kgotsa 'go tshwana le'. Go lekanyetsa ke fa barutwana ba dirisa go tlhaloganya ga bona ga dinomore go dira diphopholetso tse di nepagetseng mme e bile di utlwala mabapi le dilekanyo le bokaakang fa mo letlhakoreng le lengwe ba lemoga gore tekanyetso ga e tlhoke nepagala. Go le gantsi barutwana ba tshaba go fopholetsa ka ntlha ya fa ba tshaba go fosa.

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.

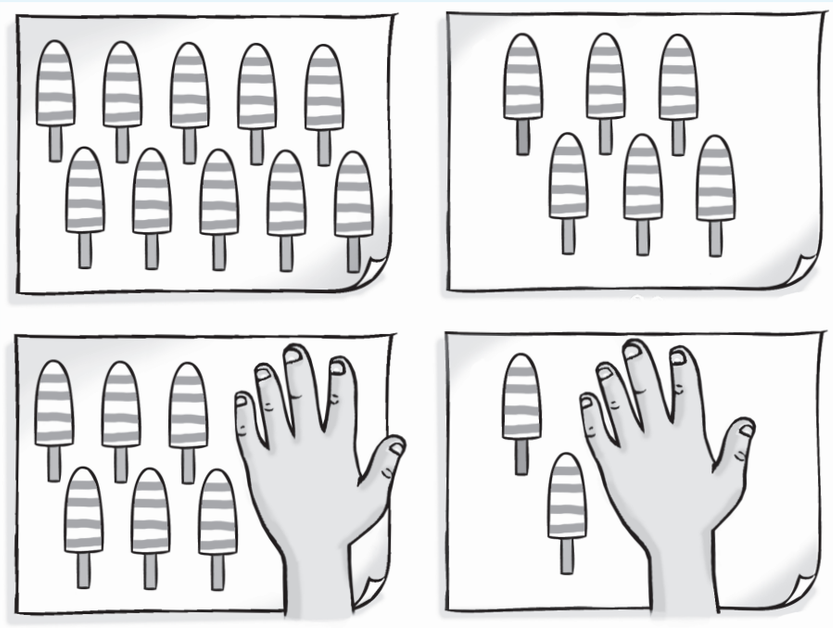


Figure 51 Estimating based on the visual image that is seen

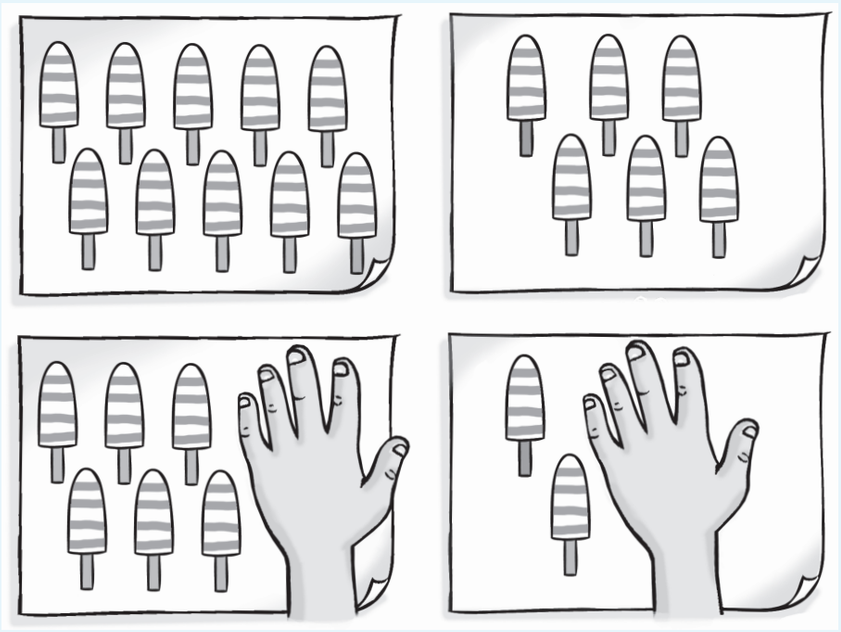
Ordinal numbers

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'.

Ka go ikatisa ...

Le fa barutwana ba ka tswa ba sa kgone go bala palo ya dilo ka nepo, ba ka bona karabo ka go lekanyetsa.

- Go ikaegile ka tshwantsho ya pono barutwana ba ka bona gore go na le dilo tse dintsi kgotsa dilwana mo setshwantshong. Ba ka bua gore ke sefe se se nang le di le dintsinyana kgotsa se se nang le di le mmalwa.
- Barutwana ba ka bona karabo ka go dirisa nyalanyo ya nngwe ka nngwe ya dilo go tswa mo dikokoanyong tse pedi go bapisa gore ke kokoanyo efe e e nang le bontsi le e e nang le bonnye.
- Barutwana ba ka bapisa palo ya dilwana mo ditshwantshong tse pedi ka go rala mola go dikologa palo e e tshwanang ya dilwana mo setshwantshong sengwe le sengwe.
- Barutwana gape ba ka dirisa diatla go bipa palo ya dilwana, sekao, dibebetsididi di le nne mo setshwantshong sengwe le sengwe. Go tlaa nna mo pontsheng gore go na le dibebetsididi di le dintsi tse di bonweng mo setshwantshong sa ntlha.



Setshwantsho 51 Tekanyetso go ikaegilwe ka setshwantsho sa pono se se bonwang

Dipalokemotatelano

Dipalokemotatelano di dirisetswa go tlhalosa sebaka kgotsa maemo a motho kgotsa selo, sk. mo moleng. Barutwana ba tlhaloganya gore fa ba gaisanela lebelo ga ba bone maemo a 'tharo' ba bona maemo a 'boraro'. Ka yona tsela eo, ba itse gore ga ba mo maemong a 'nngwe' mo moleng ba mo maemong a 'ntlha'.

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).

Setshwantsho 52 Maemo a ntlha, a bobedi le a boraro

Palelo

Go tlhaloganya go go nonofileng ga nomore le go bala go botlhokwa mo go ithuteng palelo. Barutwana ba tlhoka go tlhaloganya pele kamano magareng ga: papiso, tatedisano, le go arologanya dinomore (go tlhatlhamolola le go aga) gore ba kgone go ithuta ditiro, jaaka go tlhakanya, go ntsha, go atisa le go arola.

Ditirwana le maitemogelo a a akaretsang go tlhatlhamolola le go aga dinomore, go tlaleletsa le go bapisa mo kokoanyong ke tshimologo ya mogopolo wa go kopanya (go tlhakanya) le go aroganya (go ntsha). Barutwana ba Mophato R le bona ba kopane le go tlhakanya mmogo le go ntsha mo metshamekong le mo ditirwaneng tsa bona tsa letsatsi le letsatsi, sk. fa ba tshameka motshameko wa 'go reka' kgotsa fa ba aroganya ditshamekisi. Go ntsha, barutwana ba tlhoka go tsaya karolo mo ditirwaneng tsa tiragatso tse di akaretsang 'go ntsha', ka mafoko a mangwe, go batla gore go setse dilo di le kae mo kokoanyong fa dingwe di tlositswe. Kwa tshimologong barutwana ba tlaa dirisa ditogamaano tsa go bala go rarabolola dipalo tse di akaretsang go tlhakanya kgotsa go ntsha, sk. go bala dilo tsotlhe mo dingataneng tse pedi tsa dikokoanyo go fitlha kwa palogotlheng fa dingatana tse pedi tsa dikokoanyo di kopantswe, kgotsa go bala gore go na le dikhoene di le kae tse di setseng fa dingwe di ntshitswe.

Katiso, go arola, le dipalophatlo ga di rutiwe ka tlhomamo mo Mophato R, mme barutwana ba dirisa megopolo eno fa ba rarabolola dipalo tse di akaretsang go dira ditlhopha tsa dilo le fa ba arogana sengwe ka go lekana. Ditirwana tse di akaretsang tlhakanyopoeletso le ntshopoeletso di alela megopolo ya go tlhakanya le go ntsha motheo. Ditirwana tseno gape di thusa go tlhomamisa dikamano magareng ga go tlhakanya le go atisa, le go ntsha le go arola, tse di tlhokang go tlhaloganngwa mo isagong kwa sekolong.

Ka go ikatisa ...

Neela barutwana dipalo tse di tlhotlhomisang go dira ditlhopha tse di lekanang le go arogana ka go lekana, sekao:

- Kopa barutwana ba bararo gore mongwe le mongwe wa bona a tshware dibadi tse pedi. Mmogo ba bale palogotlhe ya dibadi, sk. pedi le pedi ke nne le pedi ke thataro (tlhakanyopoeletso).

- 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.

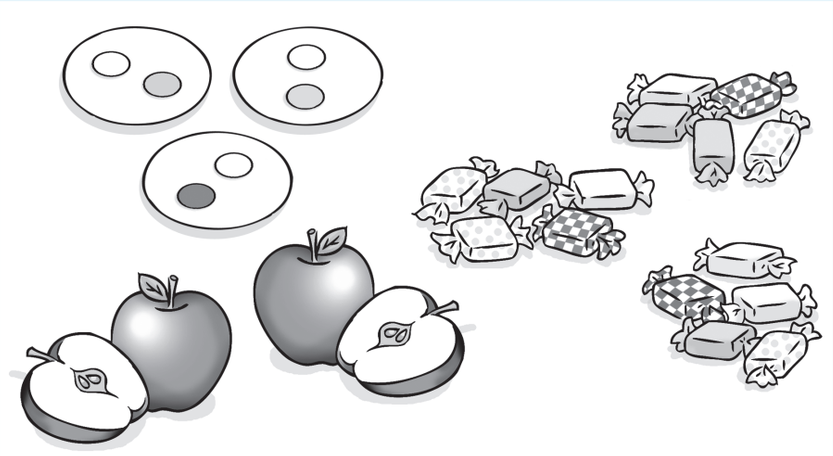
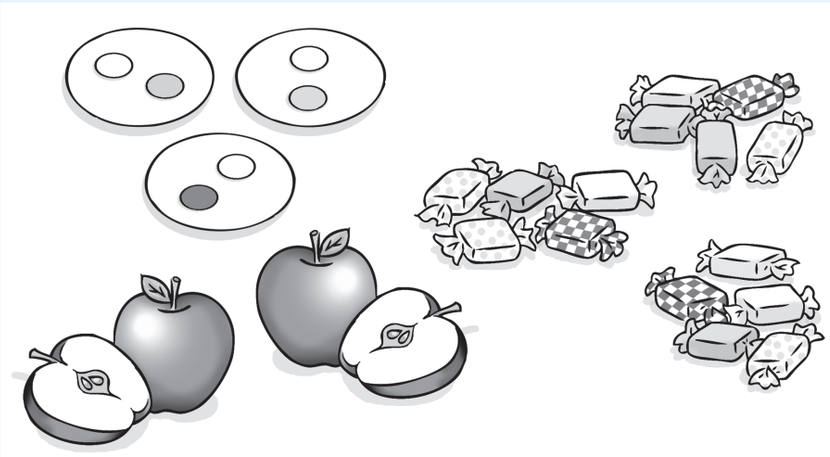


Figure 53 Using objects for calculations

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?

- Baya dibadi tse thataro mo mmetsheng. Ntsha tse pedi ka nako e le nngwe jaaka fa o re, 'thataro ntsha pedi ke nne, ntsha pedi ke pedi ntsha pedi go sala lefela' (ntshopoeletso).
- Neela barutwana didiko tse di segolotsweng. Ba kope go tlhama ditlhopha tse di lekanang mo sedikong sengwe le sengwe ka go dirisa dibadi, sk. pedi mo sedikong se sengwe le se sengwe.
- Kopa barutwana go arogana dilo ka go lekana, sk. aroganya dibadi di le 15 magareng ga barutwana ba bararo.
- Kopa barutwana go arogana dilo ka go lekana, sk. aroganya barutwana ba bararo diapole tse pedi ka go lekana.



Setshwantsho 53 Go dirisa dilo go balela

Dipotso tse o ka di botsang mo Dinomoreng, Ditirong le Dikamanong

- A o ka rulaganya tseno ka tsela e e farologaneng?
- Go na le tse kae?
- O ka bala di le kae?
- Ke mang yo o nang le tse dintsinyana/mmalwa?
- Ke nomore efe e e tlang pele …? Ke nomore efe e e tlang morago …? Ke nomore efe e e magareng ga … le …?
- Go na le tse dintsinyana go le go kae mo setlhopheng se?
- Fa re arogana tseno ka go lekana, mongwe le mongwe o tlaa nna le tse kae?
- Fa ke bipa dingwe tsa tse, go fitlhegile di le kae?
- Nomore e ke efe? (go bontsha karatapalo kgotsa palo e e kwadilweng)
- A o ka rulaganya dikaratapalo ka tatelano?
- Ke mang yo o emang pele, wa bobedi, …?
- Fa o na le tseno di le pedi ke bo ke go fa tse dingwe gape tse pedi, o tlaa nna le tse kae?
- Fa ke na le tseno di le tharo ke bo ke go fa e le nngwe, ke tlaa sala ka tse kae?

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

Tlotlofoko ya Dinomore, Ditiro le Dikamano

Go bala le go lemoga dinomore

- nyalanya, rulaganya, bapisa
- nomore
- nngwe, pedi, tharo … masomepedi le go feta
- sepe, lefela, ga go sepe, noto, lefela
- di kae …?
- bala (go fitlha) ka
- tswelela go bala (go tswa go, go ya go)
- balela morago (go tswa go, go ya go)
- bala ka bongwe, bobedi … bolesome …
- go feta, ntsi, mmalwa, mmalwanyana
- mmalwanyana eo, kgolo go, ntsi thata, nnye thata
- ntsi go feta, mmalwa go feta, lekane, go sa lekana
- nngwe le nngwe e e latelang
- kokoanyo, ya setlhopha
- batlile, gaufi le, batlile go lekana le
- go setse di le kae, setseng
- go feta ka, fa tlase ka

Bapisa le go rulaganya dinomore

- nyalanya, rulaganya, bapisa, latedisanya
- palo e e tshwanang le, ntsi jaaka
- feta ka nngwe, feta ka pedi, …
- feta ka nngwe, tlase ka pedi, …
- fa pele ga, morago, latela, gaufi le, magareng
- ntlha, bobedi, boraro … bolesome
- bofelo, pele, morago

Ya dilo/bokaakang tse **pedi**: kgolwane, feta, kgolwane, tlase, mmalwanyana, nnyenyana

Ya dilo/bokaakang jwa dilo tse **tharo**: kgolo thata, ntsintsi, kgolo thata, kgolo thata, nnye thata, mmalwa thata, nnye thata

Ditiro ka dinomore

Go tlhakanya le go ntsha

- nyalanya, bapisa
- tlhakanya, feta, le
- mmogo, mmogo ka kakaretso
- go oketsa gabedi/seripa
- feta ka nngwe, feta ka pedi, …
- go tlhokega gape tse kae go dira, …?
- bontsi jo bo kae gape ke … go na le, …?
- tseela kwa ntle, ntsha
- feta ka nngwe, tlase ka pedi, …
- go setse di le kae?
- pharologanyomagareng

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

Go atisa le go arola

- dingatana, ditlhophana tsa bobedi, boraro, …
- arogana sentle/ka go lekana
- arogana, aroganya magareng
- arogana e le nngwe/go feta e le nnngwe ka nako e le nngwe
- go tshwana le, farologane le
- go setse di le kae, setseng

Go lekana

- nyalanya, bapisa
- go tshwana
- tshwana le, farologane le
- dira
- lekana le
- ditlhopha tse di lekanang

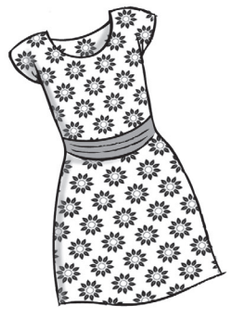
Lekanya

- nyalanya, bapisa
- fopholetsa gore di kae; lekanya
- batlile, gaufi le
- batlile go tshwana
- tlasenyana, godimonyana
- ntsi go feta, mmalwa go feta, lekane, go sa lekana

Dipaterone, Ditiro le Alejibora

Paterone e re dikologile. Barutwana ba kopana le dipaterone le **ditatelano** mo maitsholong a batho, letsatsi le letsatsi, mo malatsing a beke, mo dikgweding tsa ngwaga, mo ditshekong tsa bosa, mo mminong le mo botsweretshing, le mo tikologong ya bona. Sekao:

- diaparo



Setshwantsho 54 Dipaterone mo diaparong

LENAANEFOKO

paterone
paterone e e tlwaelegileng ya dilo, metsamao le ditiragalo tse di ipoeletsang ka mokgwa o o bonelwang pele

tatelano
thulaganyo e e rileng, moo dilo, metsamao kgotsa ditiragalo di latelanang ka yona

- buildings

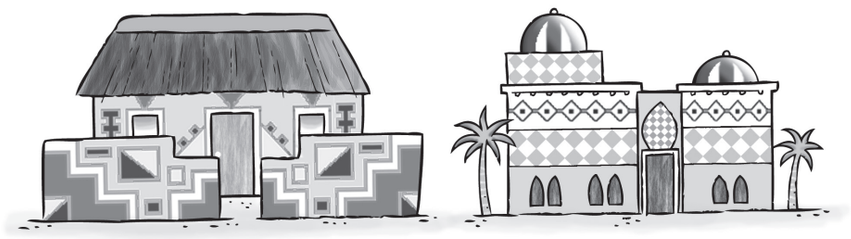


Figure 55 Patterns in buildings

- nature

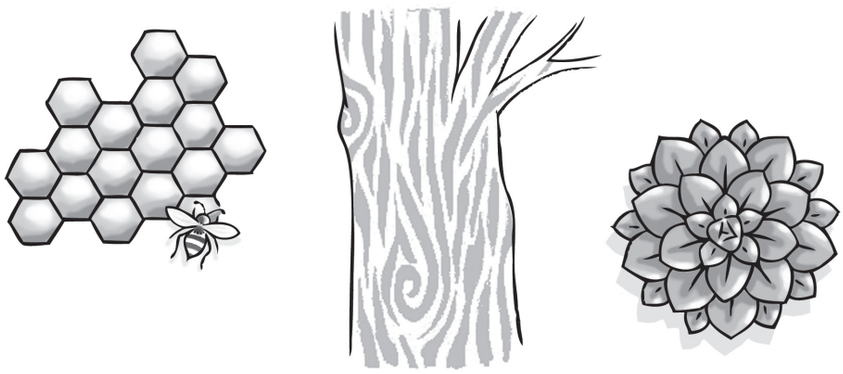


Figure 56 Patterns in nature

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.

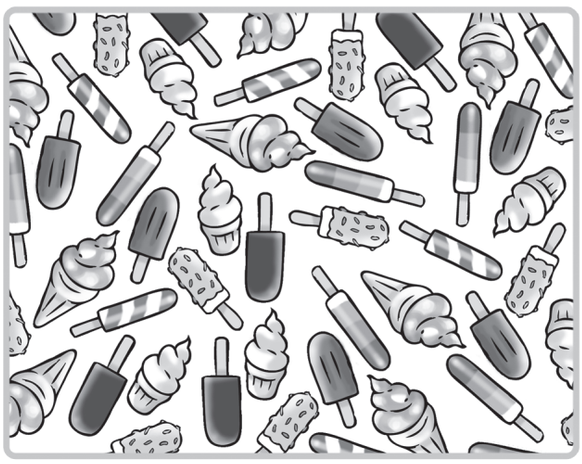
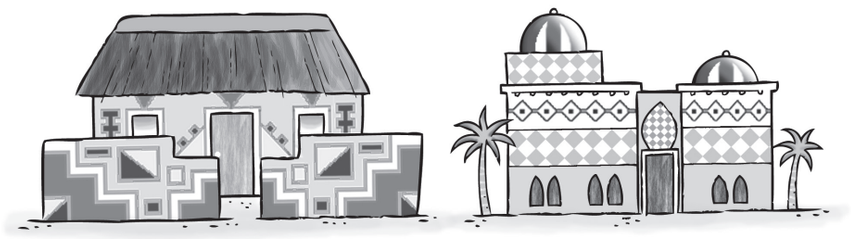


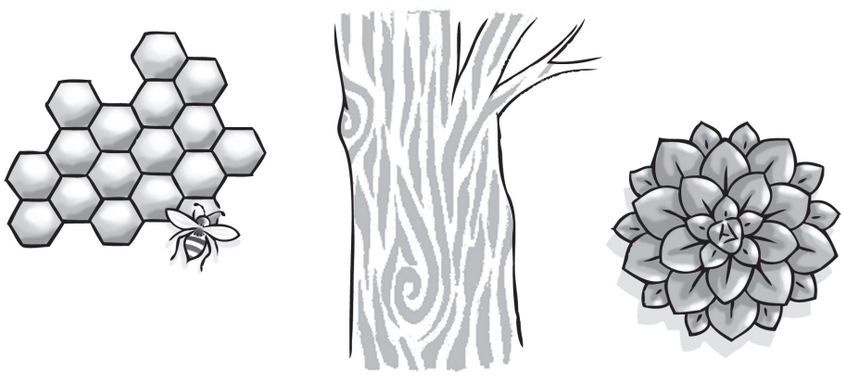
Figure 57 Irregular patterns

- dikago



Setshwantsho 55 Dipaterone mo dikagong

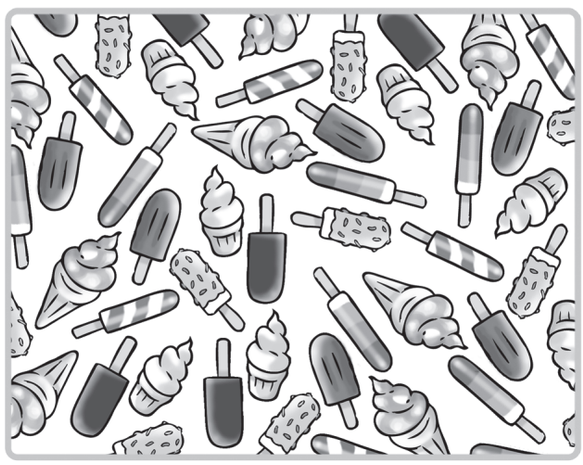
- tlhago



Setshwantsho 56 Dipaterone mo tlhagong

Go lemoga dipaterone

Bana ba bannye ba na le go tota mmala le go ngokela ga setshwantsho kgotsa selo, sk. pampiritshana e e phuthelang, mme ba tlaa bo ba re e na le 'paterone e ntle'. Bontsi jwa dipaterone tseno ke **dipaterone tse di sa tlwaelegang**. Re ka kgona go bona gore go na le poeletso ya dilo, mebala kgotsa dibopego mme ga re kgone go tlhalosa gore poeletso e dira jang.



Setshwantsho 57 Dipaterone tse di sa tlwaelegang

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?'

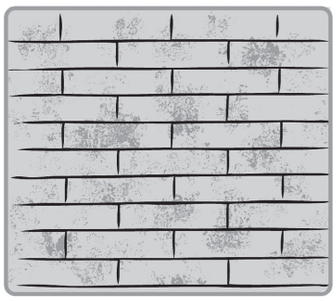
Different types of patterns

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

Barutabana ba tshwanetse go bontsha barutwana dipaterone tse di mo phaposiborutelong le tse di kwa ntle. Sekao, ba bontshe gore ditena mo loboteng di rulagantswe jang, dithaele tse di adilweng mo tseleng kgotsa matshwao mo diphologolong.



Setshwantsho 58 Dipaterone tse di re dikologileng

Mo **pateroneng e e tlwaelegileng** re kgona go bona gore **dielemente** mo pateroneng di boleditswe jang mme e bile re kgona go bonela pele tatelano kgotsa thulaganyo e paterone e tlaa e tsayang, sk. mo pateroneng e e latelang re kgona go bona gore sediko le khutlonne di boeleditswe mme e bile re ka bonela pele gore sebopego se se latelang e tlaa nna sediko, jalo jalo.

LENAANEFOKO

dielemente
dilo metsamao kgotsa ditiragalo mo pateroneng

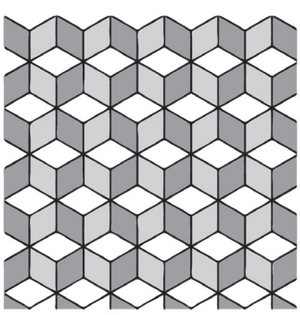
Setshwantsho 59 Paterone ya sediko, khutlonne

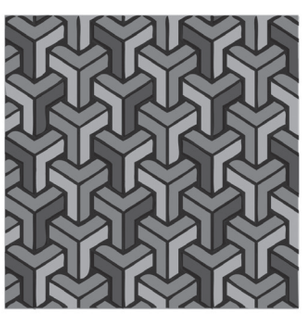
Mo Mophato R, barutwana ba ka tswa ba kgona go lemoga paterone mme ba ka tswa ba sa kgone go lemoga kgotsa go tlhalosa 'se se dirang paterone'. Barutabana ba ka thusa barutwana go lemoga dipaterone ka go ba botsa gore ke eng se se dirang paterone e e rileng le gore dielemente di latelana jang. Sekao, mo pateroneng e e fa godimo: 'Sebopego sa ntlha ke sefe? Go latele sebopego sefe? O akanya gore go tlaa latela sebopego sefe?'

Mefuta e e farologaneng ya dipaterone

Dipaterone tsa jeometeri

Paterone ya jeometeri ke paterone e e dirilweng ka mela le dibopego tsa jeometeri tse di rulagantsweng ka thulaganyo e e ipoletsang, sekao, rombase, khutlonnetsepa kgotsa sebopegotlhano. Dipaterone tsa jeometeri di ka bonwa mo tikologong ya rona, sk. dithaele tse di adilweng mo bodilong le pampiri ya sephuthelwana.





Setshwantsho 60 Dipaterone tsa jeometeri

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.

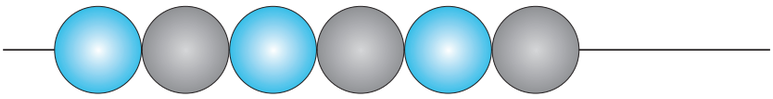


Figure 61 AB pattern

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

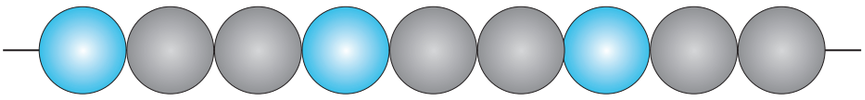


Figure 62 ABB pattern

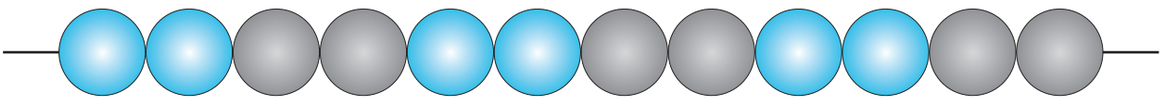


Figure 63 AABB pattern

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

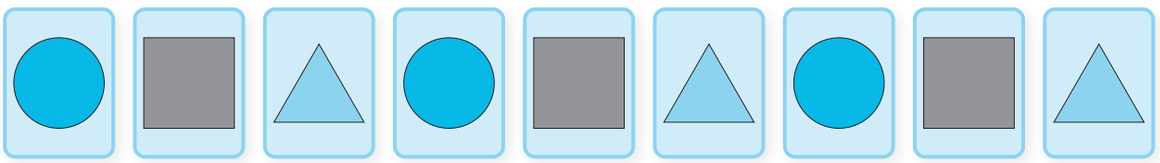


Figure 64 ABC pattern

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.

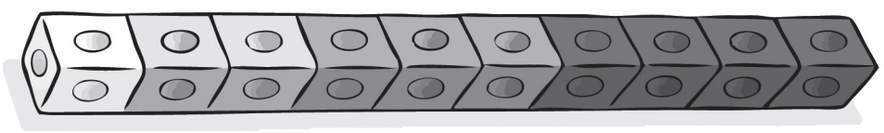
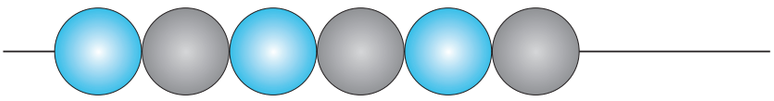


Figure 65 Growing pattern

Poeletsodipaterone

Poeletsodipaterone e dirilwe ka dielemente tsa tatelano e e ipoeletsang, sekao, dibopego, mebala, medumo, metsamao kgotsa ditiragalo.
Mo poeletsodipateroneng, dielemente tse di tshwanang di ipoeletsa gangwe le gape.



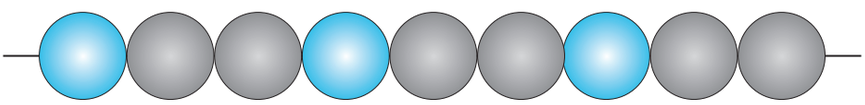
Setshwantsho 61 AB paterone

Simolola ka go itsise barutwana ka ga dipaterone tsa **ponagalo** e le nngwe, sk. mmala kgotsa sebopego, o bo o neele tatelano e e ipoeletsang ka boleele jo bo lekaneng gore barutwana ba feleletse paterone.

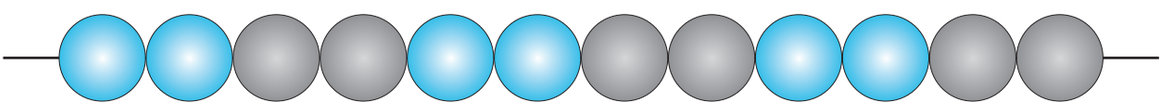
Barutwana ba ka lemoga dipaterone tse di gwetlhang thata, jaaka dipaterone tsa ABB kgotsa AABB.

LENAANEFOKO

ponagalo
ponagalo kgotsa popego ya sengwe, sekao, mmala kgotsa sebopego

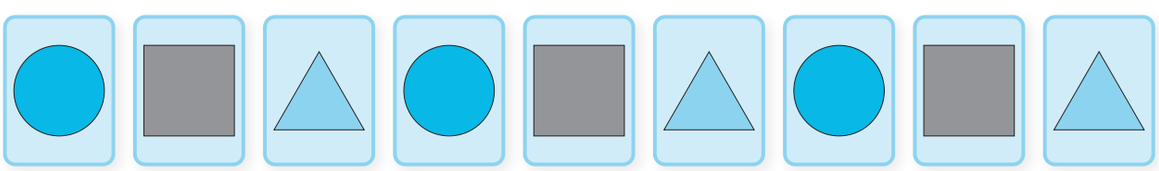


Setshwantsho 62 Paterone ya ABB



Setshwantsho 63 Paterone ya AABB

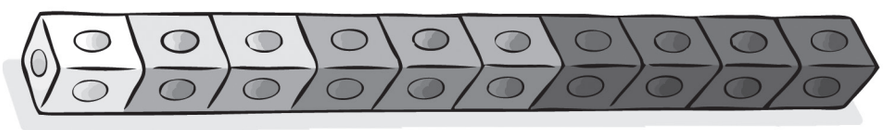
Itsise barutwana dipaterone tse di nang le diponagalo di le pedi kgotsa go feta ka iketlo, jaaka mmala le sebopego.



Setshwantsho 64 Paterone ya ABC

Dipaterone tse di golang

Dipaterone tse di golang di farologane le dipoeletsopaterone ka gobo paterone e gola kgotsa e ngotlega ka bogolo mo tatelanong e nngwe le e nngwe. Mo pateroneng e e mo Setshwantshong 65, palo ya diboloko tse di mmalafaditsweng e oketsega ka nngwe mo tatelanong e nngwe le e nngwe ya diboloko.



Setshwantsho 65 Paterone e e golang

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

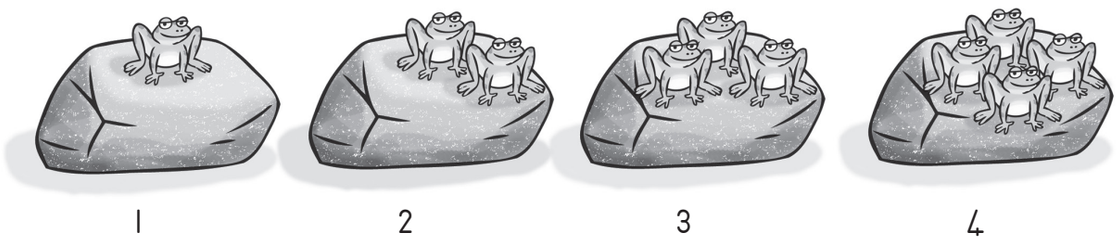


Figure 66 Growing pattern

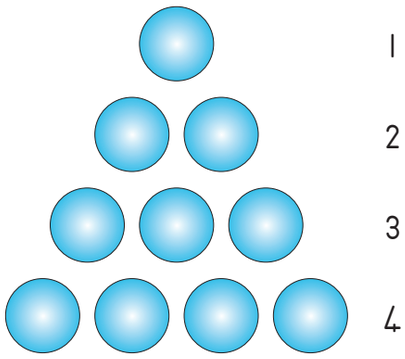


Figure 67 Growing pattern

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

Figure 68 Growing pattern

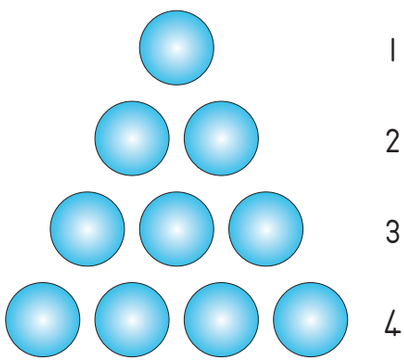
Patterning skills – what learners need to know

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

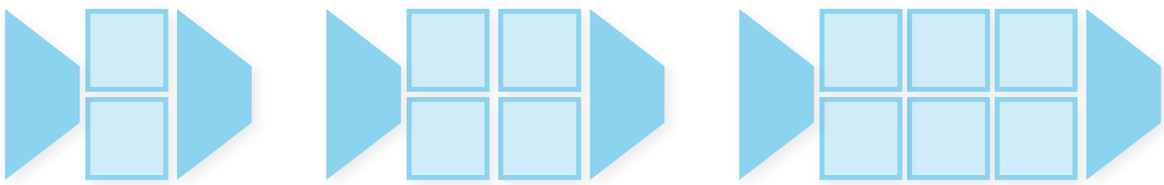
Barutwana ba ka amana paterone le tatelano ya dinomore le go lemoga gore nomore e oketsega ka nngwe nako nngwe le nngwe.

Setshwantsho 66 Paterone e e golang



Setshwantsho 67 Paterone e e golang

Mo pateroneng e e latelang, tatelano e oketsega ka pedi nako nngwe le nngwe.



Setshwantsho 68 Paterone e e golang

Dikgono tsa go dira dipaterone – se barutwana ba tlhokang go se itse

Dikgono tsa barutwana di tlaa farologana fela barutwana ba Mophato R ka kakaretso ba tlaa kgona go ka:

- nyalanya le go rulaganya dilo go ya ka ponagalo e le nngwe kgotsa go feta, sk. sebopego, mmala, modumo
- bapisa ditshwano le dipharologano mo dilong tse pedi kgotsa go feta
- bua ka dipaterone tse di tlhagelelang mo maitemogelong a letsatsi le letsatsi
- lemoga dipaterone mo tikologong ya bona, sk. dipale tsa fense, ditena, boalotena
- lemoga dipaterone
- kopolola dipaterone tse di dirilweng ke ba bangwe
- atolosa dipaterone tse di simolotsweng ke ba bangwe

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

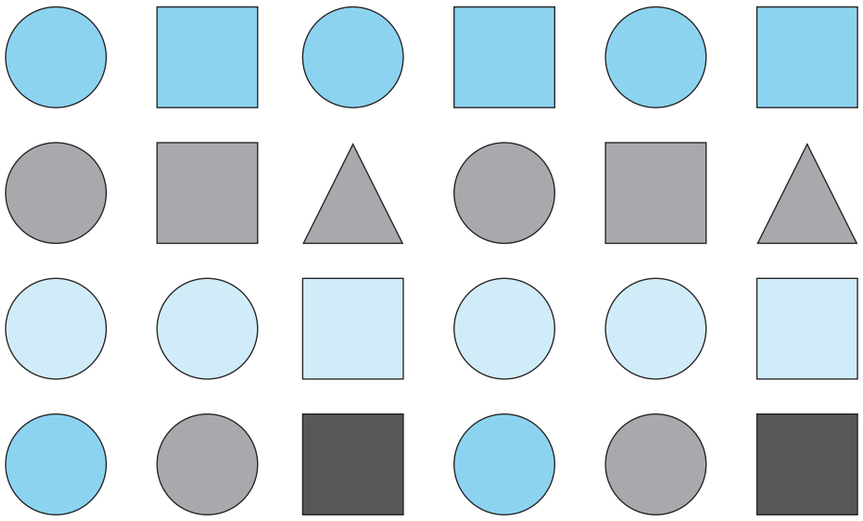


Figure 69 Creating patterns

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

In practice ...

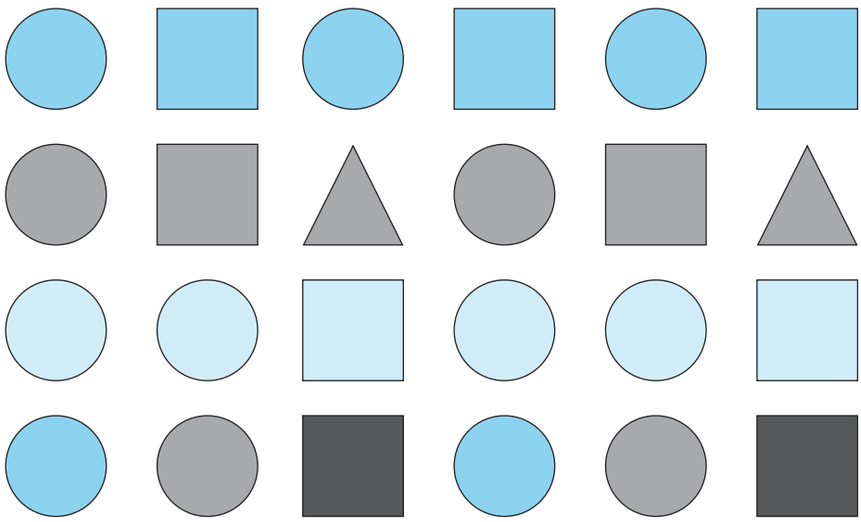
Teachers should guide learners to recognise and make patterns and provide opportunities for them to observe, describe and discuss patterns, focusing on activities that involve:

- 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?

- itlhamela dipaterone mo maemong a a farologaneng ka matswakabele jaaka:



Setshwantsho 69 Go tlhama dipaterone

- go bolela gore go tlhaelang fa karolwana ya paterone e fitlhegile.

Ka go ikatisa ...

Barutabana ba tshwanetse go kaela barutwana go lemoga le go dira dipaterone mmogo le go ba tlamela ka ditšhono tsa go lemoga, go tlhalosa le go buisana ka ga dipaterone, ba totile ditirwana tse di akaretsang:

- go bua ka ga 'se se dirang paterone'
- go tlhotlhomisa dipaterone ka go dirisa dilo, ditshwantsho le morumo, jaaka go opa diatla, mo nakong ya go ithuta dipalo le ka nako ya botsweretshi jwa boitlhamedi, mmino le ditirwana tsa katiso mmele kwa ntle
- go dira dipaterone tsa bona le go bua ka ga go gore ba latedisanya jang dielemente le gore goreng ba di latedisanya jalo ka tsela e e rileng
- go rala dipaterone le go dirisa mebala e e farologaneng le dibopego, le go bua ka tsela e paterone e boeleditsweng ka yona.

Dipotso tse o ka di botsang mo Dipateroneng, Ditirong le Alejibora

- A o bona paterone? Mpolelele ka yone.
- Ke eng se se tlang la ntlha, la bofelo, se se latelang, morago, pele?
- A dipaterone tse pedi tseno di a tshwana? Di farologana jang? O ka dira jang gore di tshwane?
- A o ka kopolola paterone eno? Go tlaa latelang mo pateroneng?
- Nka dirang go atolosa paterone eno?
- A o ka mpolelela gore paterone ya gago ke eng? A o ka dira paterone e e farologaneng? Go tlhaelang mo pateroneng eno?

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

Tlotlofoko ya Dipaterone, Ditiro le Alejibora

- nyalanya, bapisa, rulaganya, latedisanya
- simolola, tshimologo
- ntlha, gare, bofelo
- pele, morago, bokhutlo
- go latelang …?
- selekanyo
- kgolo, kgolwane, kgolo thata
- nnye, nnyenyana, nnye thata
- tshwana, farologane, pharologano
- maina a mebala
- aga paterone
- lemoga
- bontsha, lemoga
- tswelela, tswelela, atolosa
- kopolola
- boeletsa, gape
- tlhalosa, tlhalosa
- go tla eng pele/morago?
- latela, magareng
- mo moleng, mo mothalong
- sebaka, tlogetse sebaka

Boalo le Popego (Jeometeri)

Bana ba bannye ba tlhotlhomisa sebopego le sebaka mo ditirwaneng tsa bona tsa letsatsi le letsatsi fa ba leka go tlhaloganya dipopego le dibopego tse di re dikologileng, jaaka sefatlhego sa mmaabona, dilo tse di tsamayang le mebele ya bona. Ba tlhotlhomisa megopolo ya dibaka e e amanang le sebopego le sebaka fa ba tshameka ka dikgwele kgotsa ba tsena le go tswa mo mabokosong le fa ba palama mo godimo le go tsena ka fa tlase ga dilo. Ba lemogile dibopego tse di farologaneng mo dilong kwa magabona le kwa ntle, jaaka maru, dikago, matlhare le dijanaga.

Bana ba bantsi ba tsena mo Mophato R ka kitsonyana ya dibopego tse di farologaneng mme ba ka tswa ba kgona go lemoga le go rala dibopego tse di tshwanang le didiko le dikhutlotharo. Ba ka tswa gape ba kile ba tshameka ka diboloko, ditshamekisi tsa dikago le diphazele. Mo Mophato R, barutwana ba agelela mo maitemogelong ano fa ba ithuta ka ga sebaka, sebopego, maemo, **tlwaetso**, tebelelo le kaelo. Ba tlhoka ditšhono tse e seng kana ka sepe go tlhotlhomisa le go batlisisa dilo tse di farologaneng tsa letsatsi le letsatsi. Maitemogelo ano a sebaka le sebopego a thusa go ala motheo o o popota go tlhaloganya **jeometeri** mo mephatong e e tlaa latelang.

LENAANEFOKO

tlwaetso
dilo di beilwe jang kgatlhanong le tse dingwe

jeometeri
karolo ya dipalo e e dirang ka dipharologantsho, tekanyo le dikamano tsa dintlha, mela le dikhutlo tsa dibopego mo sebakeng

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.

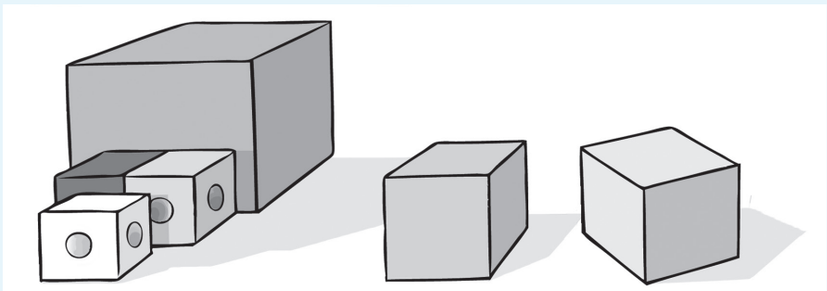


Figure 70 Exploring position

Sebaka

Bana ba itlwaetsa sebaka ka go dirisa mebele ya bona. La ntlha ba tlhotlhomisa kamano magareng ga bona, batho ba bangwe le dilo. Masea a fitlhelela le go tshwara dilo tse di gaufi le bona mme ba simolola go tsamaya tsamaya ka iketlo le go tlhotlhomisa tikologo ya bona ka go dirisa ditemosi tsotlhe tsa bona. Ba tlhotlhomisa se se diragalang fa ba kgorometsa, ba goga, ba kgokolosa kgotsa ba retolola dilo tse di farologaneng fa ba ntse ba tshameka ka tsona, mme fa ba dira jaana ba a itemoga kgatlhanong le dilo. Gape ba ithuta ka ga maparego a motsamao wa bona fa ba ntse ba palama le go tsena ka fa tlase ga ditulo, mabokoso, ba iphitlha fa morago ga ditlhare kgotsa ba lebelela kwa tlase mo direpoding.

Boemo

Boemo mo Mophato R bo simologa ka maemo a dilo kgatlhanong le morutwana, mme a tswelela ka maemo a dilo kgatlhanong le tse dingwe. Tlotlofoko ya boemo e akaretsa mo, mo go, godimo ga, fa pele ga, fa morago, mo magareng, gaufi le, jalo le jalo.

Ka thuso ya bagolo kwa lapeng le barutabana kwa sekolong, barutwana ba Mophato R ba ka nna le tlotlofoko ya go tlhalosa sebaka, boemo le kaelo fa ba ntse ba tshameka, ba batla dilo kgotsa ba palama dilo.

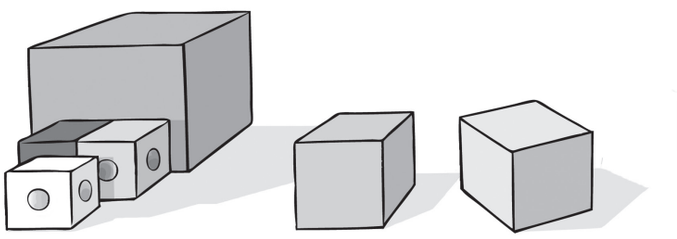
Ka go ikatisa ...

Go na le ditšhono tse dintsi tota mo letsatsing go kgontsha barutwana go akanya ka ga manno le go dirisa tlotlofoko ya maemo:

- mo metshamekong
- fa ba phutha dilo ka nako ya go phepafatsa
- fa ba fola mela
- fa ba bua ka ga kwa dilo di leng gona mo ditshwantshong le mo mainaneng.

Go letla barutwana go tlhotlhomisa metsamao ya bona:

- tlhama sekgoreletsi mo teng kgotsa kwa ntle ka go dirisa ditulo, dithaere, mabokoso le/kgotsa dipolanka
- diragatsa mainane a a dirisang tlotlofoko ya dipalo ka ga boemo, sk. mo godimo le kwa tlase, gaufi le kgakala, fa thoko le mo gare
- baya dilo mo maemong le boemong le mo tlwaetsong e e farologaneng
- kopa barutwana go lebelela dilo go tswa mo maemong a a farologaneng (tebelelo) le gore ba bue gore ba bonang.



Setshwantsho 70 Go tlhotlhomisa maemo

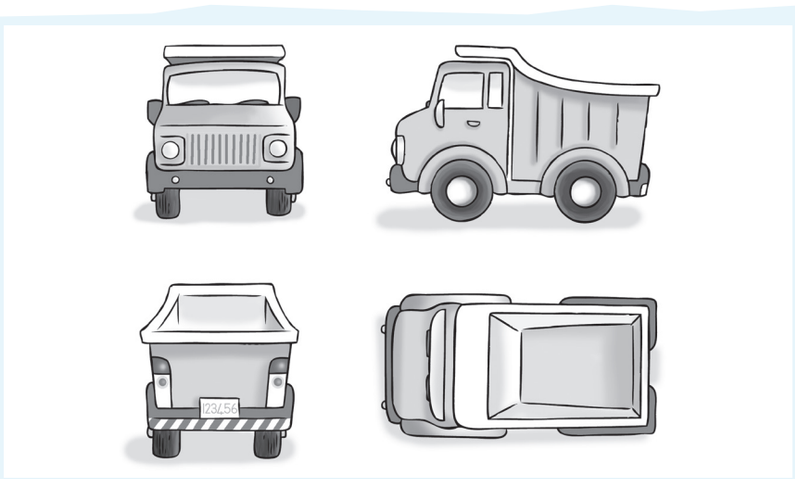


Figure 71 Different orientations

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

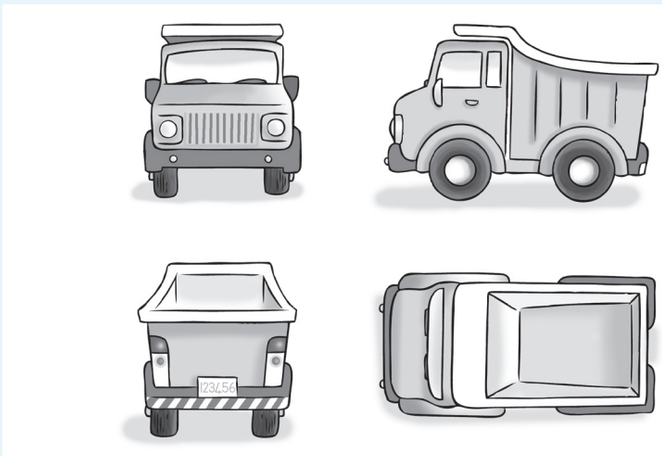
In Grade R, as learners' gain an increased understanding that when things are far away they look smaller, their concept of **perspective** develops.

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



Setshwantsho 71 Ditlwaetso tse di farologaneng

Kaelo

Barutwana ba Mophato R kwa tshimologong ba simolola go bontsha kaelo ka go supa, morago ba dirise dipolelwana tse di bonolo jaaka 'kwa'. Mogopolo wa kaelo o tswelela go tloga ka maemo a bana ba leng mo go ona go a ba yang go ona kgatlhanong le dilo tse dingwe, sk. tlhamalala, retologa, jalo jalo.

Ka go ikatisa ...

Dirisa tlotlofoko ya kaelo:

- ka nako ya dijo le go phepafatsa
- fa o neela ditaelo tsa gore dilo di bewe kae le gore o ka tswa jang mo lefelong le lengwe go ya go le lengwe
- fa o ikhitsha.

Kakanyo

Mo Mophato R, fa barutwana ba tlhaloganya gore fa dilo di le kgakala di bonala di le dinnye, mogopolo wa bona wa **kakanyo** o a gola.

LENAANEFOKO

kakanyo
seabe sa bokgakala kgotsa boteng mo tlhagelelong ya dilo

Ka go ikatisa ...

- Lebelela batho le dilo kwa ntle ga phaposiborutelo mme o bue gore ke ka ntlha ya eng di lebega di le dinnye.
- Tswala leitllho le le lengwe mme o lekanye selekanyo sa motho kgotsa selo mme o bue gore a mme se sennye jalo.
- Lebelela thata dilo mo ditshwantshong tse di bonalang di le dinnye mme o bue gore ke ka ntlha ya eng go le jalo.

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

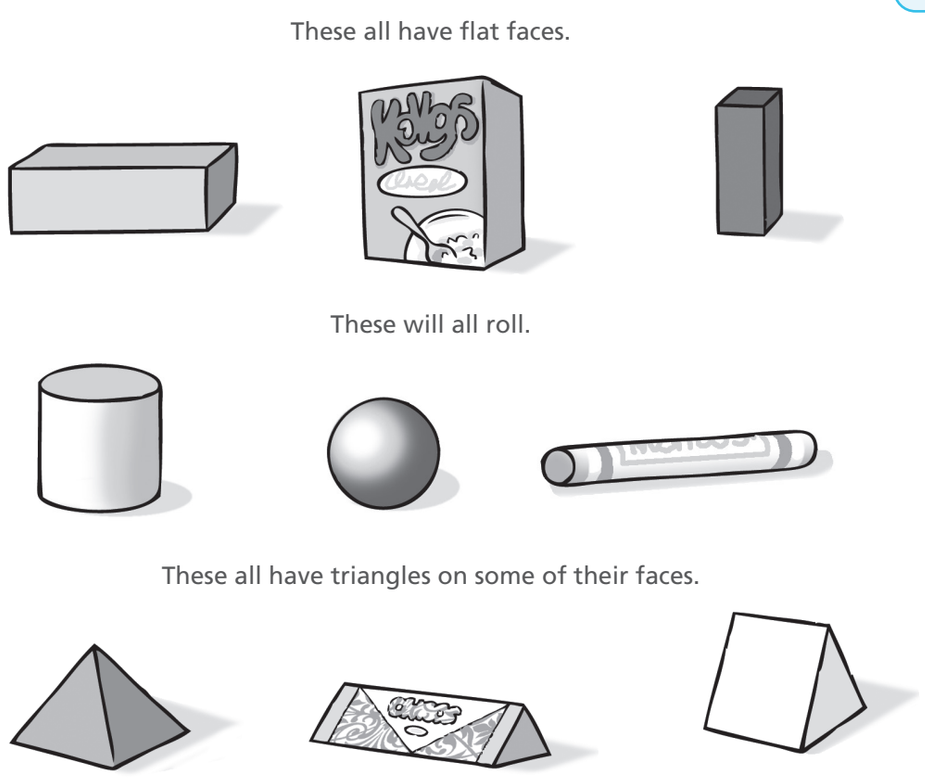


Figure 72 3-D objects

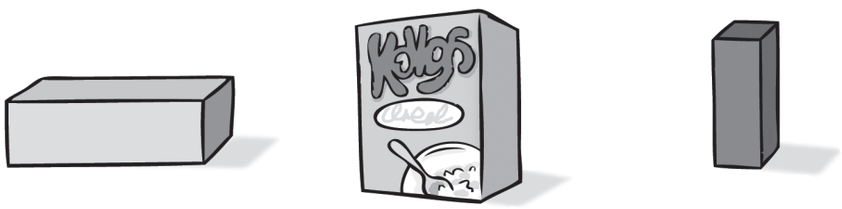
Popego

Mo Mophato R, barutwana ba tota thata go lemoga, tlhaola le go taya maina dilo **tsa tlhakoretharo (3-D)** le dibopego **tsa tlhakorepedi (2-D)**. Ka puo ya letsatsi le letsatsi, barutwana ba tlaa re ba ka lebelela selo kwa tlase go tswa mo matlhakoreng otlhe, bogodimo le botlase. Ka dipalo re tlhalosa **dipharologantsho** tsa dilo tsa tlhakoretharo ka boleele, boalo (bophara) le bogodimo. Ka puo ya letsatsi le letsatsi, barutwana ba tlaa bua ka dibopego tsa tlhakorepedi jaaka ditshwantsho, mme ka puo ya dipalo re bua ka dibopego tse di nang le boleele le boalo (bophara) go tlhalosa matlhakore a mabedi.

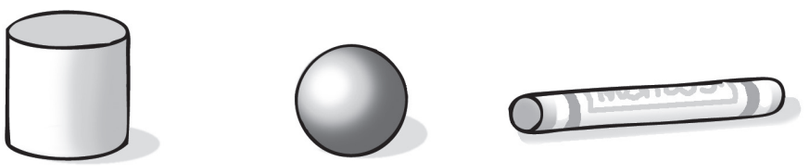
Dilo tsa tlhakoretharo (3-D)

Mo Mophato R, barutwana ba tlhotlhomisa dipharologantsho tsa dilo tsa letsatsi le letsatsi tsa 3-D. Ba aga dikago ka go dirisa dilo tse di kileng tsa dirisiwa kwa malapeng jaaka mabokoso, meteme, dibata, dipampiri tsa ntlwanaboithusetso le dikgwele. Ba tlhotlhomisa le go tlhalosa dilo tse di bopegileng jaaka mabokoso le dikgwele. Ba bapisa le go rulaganya dilo, le go bua ka ga dintlhatshwano le dipharologano.

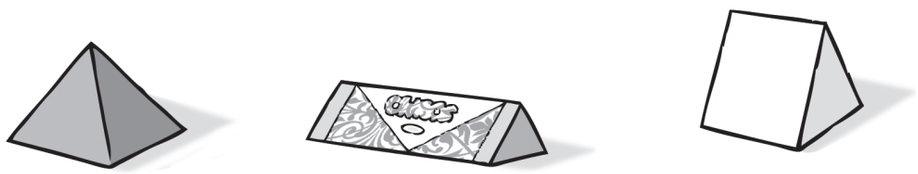
Tseno tsotlhe di na le difatla tse di sephaphathi.



Tseno tsotlhe di tlaa kgokologa.



Tseno tsotlhe di na le dikhutlotharo mo dingweng tsa difatla tsa tsona.



Setshwantsho 72 Dilo tsa 3-D

LENAANEFOKO

ditlhakorepedi (2-D)
sebopego se na le matlhakore a mabedi: boleele le boalo (bophara)

ditlhakoretharo (3-D)
e na le matlhakore a mararo: boleele, boalo (bophara) le bogodimo

pharologantsho
diponagalo tsa sebopego sa 2-D kgotsa dilo tsa 3-D, sk. boleele, bophara, bogodimo, matlhakore (difatla), mathoko, dikhutlo

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.

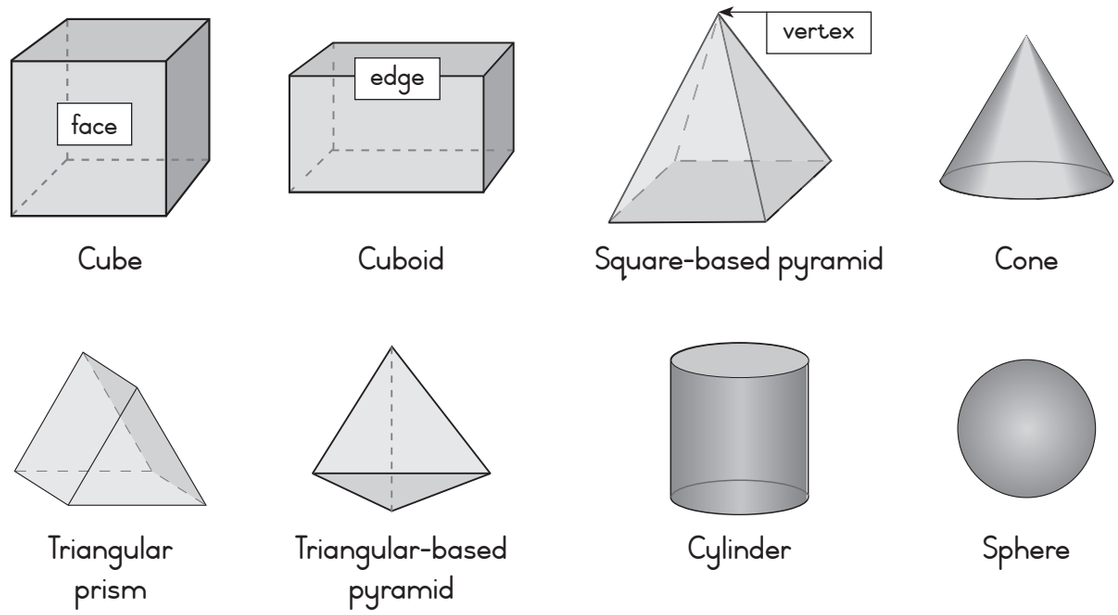


Figure 73 3-D solids

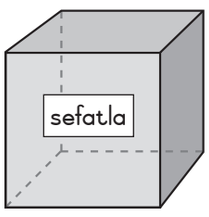
Ka go ikatisa ...

Barutwana ba ka:

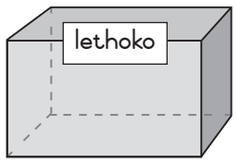
- Tshameka ka dilo tse di kokoantsweng tsa 3-D go akaretsa diboloko, meteme, mabokoso le dikgwele.
- Tlhalosa dilo. Ba ka tlhopha popego e le nngwe ka nako e le nngwe. O ka rotloetsa go akanya ga bona ka go ba botsa dipotso le go ba itsise maina a a nepagetseng le dipharologantsho tsa popego nngwe le nngwe.
- Rulaganya dilo tsa 3-D go ya ka pharologantsho e e rileng, jaaka matlhakore a a tlhamaletseng kgotsa go ya ka gore a di kgona go kgokologa. Seno se tlaa letla barutwana go itlwaetsa dipharologantsho tsa tsona le go di tlhotlhomisa.
- Tlhalosa dilo tseno ka go dirisa puo ya letsatsi le letsatsi jaaka sephaphathi, boleta, bomotsu. Fa barutwana ba lemoga dipharologantsho tse dingwe, ba ithuta maina a a maleba, sk. lethoko, sekhutlo, boalo kgotsa bokwatlase, sefatla. Ditirwana tsa go rulaganya le dipuisano ka ga dilo tse di botlhokwa ka gonne di thusa barutwana go tlhaloganya sekao, gore le fa tšhupu ya khaboto e le telele e bile e le tshesane, le gore moteme wa senotsididi o mokhutshwane, tsotlhe ke diselennere.

Barutwana ba tshwanetse go kaelwa go lemoga gore pharologantsho ya dilo jaaka boleele, bophara kgotsa bogodimo, e re e elang tlhoko fa re di rulaganya mme e seng mmala, bogolo kgotsa dipharologantsho tse dingwe.

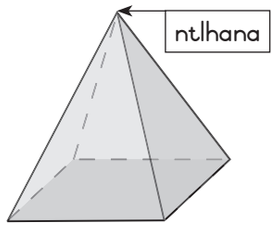
Barutwana ba Mophato R ba ka botsa gore leina la dilo ke eng, sk. seraro/khube, selennere kgotsa khounu. Mo Mephatong e e kwa godingwana barutwana ba ithuta dilo tsa 3-D tse di bontshitsweng mo Setshwantsho 73.



Seraro/Khube

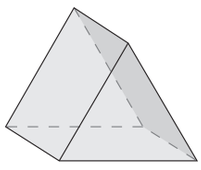


Sekaseraro

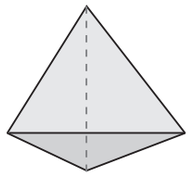


Phiramiti ya khutlonne

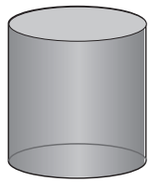
Khounu



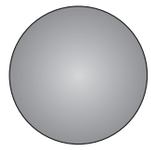
Porisime ya khutlotharo



Phiramitisekhutlotharo



Selennere



Kgolokwe

Setshwantsho 73 Dilo tsa 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.

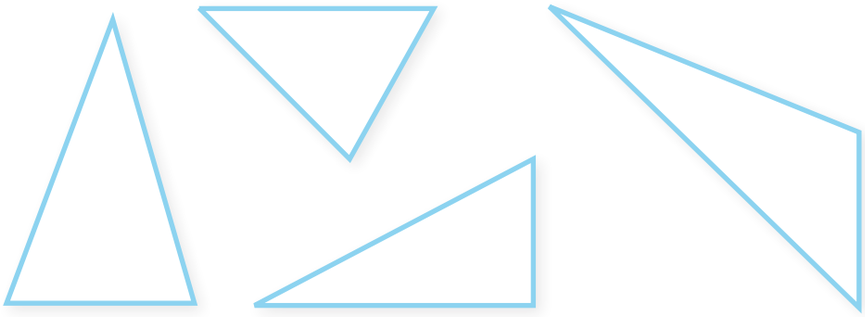


Figure 74 Shapes with three sides

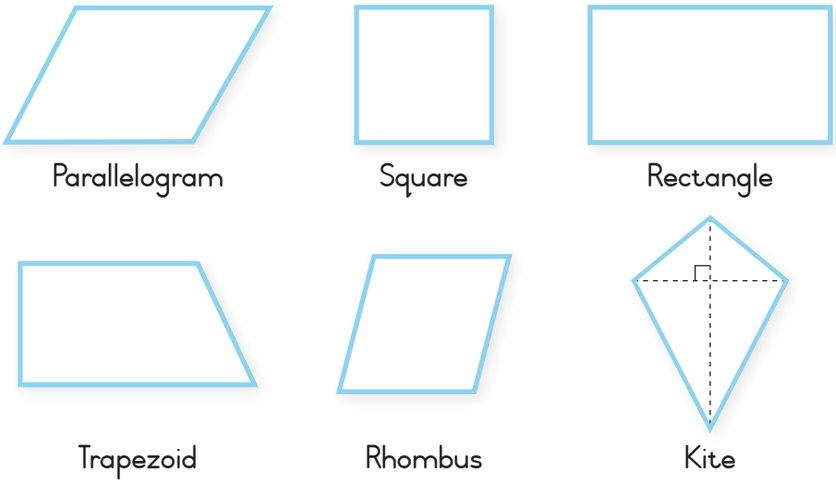


Figure 75 Shapes with four sides

Dibopego tsa ditlhakorepedi (2-D)

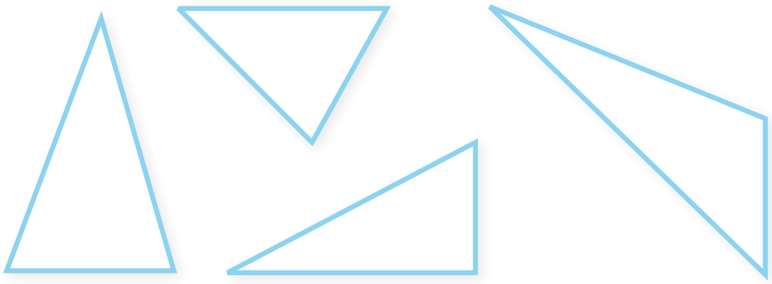
Mo Mophato R, barutwana ba lemoga, tlhaola le go taya dibopego tsa 2-D maina: didiko, dikhutlotharo, dikhutlonne le dikhutlonnetsepa. Mo teng ga phaposiborutelo le kwa ntle, ba bona dibopego mme ba ka kgona go tlhotlhomisa dipharologantsho tsa tsona mo ditshwantshong le go lebelela dibopego tse di 'tshwanang le' dibopego, sk. letshwaotsela le ka lebega e kete sediko, foreimetlhabaphefo e ka lebega e kete khutlonne, lebati le ka lebega e kete khutlonnetsepa.

Ka go ikatisa ...

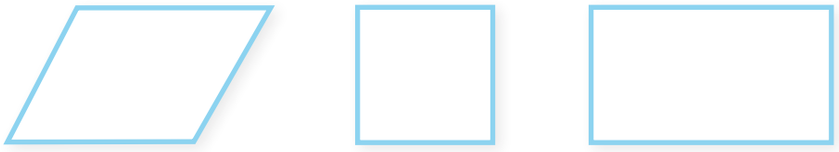
Barutwana ba ka:

- Tlhotlhomisa dipharologantsho tsa 2-D mo teng le kwa ntle ga phaposiborutelo, jaaka didiko, dikhutlonne, dikhutlonnetsepa le dikhutlotharo.
- Batla dilo tse di nang le sebopego sa 'khutlonne', jaaka letlhakore kgotsa sefatla sa lebokoso kgotsa sebopego sa 'sediko' jaaka letshwaotsela kgotsa botlase kgotsa letlhakore la kopi.
- Tlhalosa dibopego tsa 2-D tsa bogolo jo bo farologaneng le ditlwaetso mo ditshwantshong.

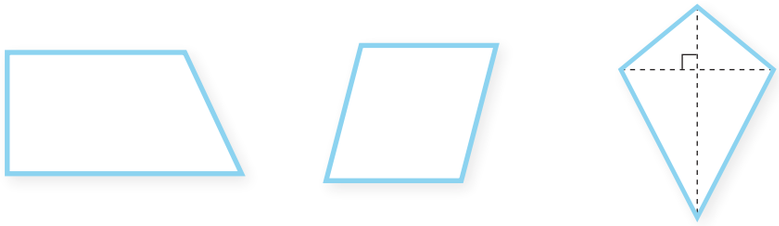
Barutwana ba tlhoka go bona dibopego tsa 2-D, sk. dikhutlotharo tse di farologaneng (e seng fela tsa mela e e lekanang), dikhutlonnetsepa tsa bogolo jo bo farologaneng. Seno se thusa barutwana go lemoga gore dibopego tse di rileng di tshwana ka eng, sekao, gore dikhutlotharo tsotlhe di na le matlhakore a mararo le dikhutlo di le tharo mme le fa go ntse jalo di ka nna tsa se tshwane, le gore dikhutlonnetsepa di na le matlhakore a mane go sa kgathalasege tlwaetso ya tsona.



Setshwantsho 74 Dibopego tsa matlhakore a mararo



Paralelokerama | Khutlonne | Khutlonnetsepa



Terapezoed | Rombase | Khaete

Setshwantsho 75 Dibopego tsa matlhakore a mane

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

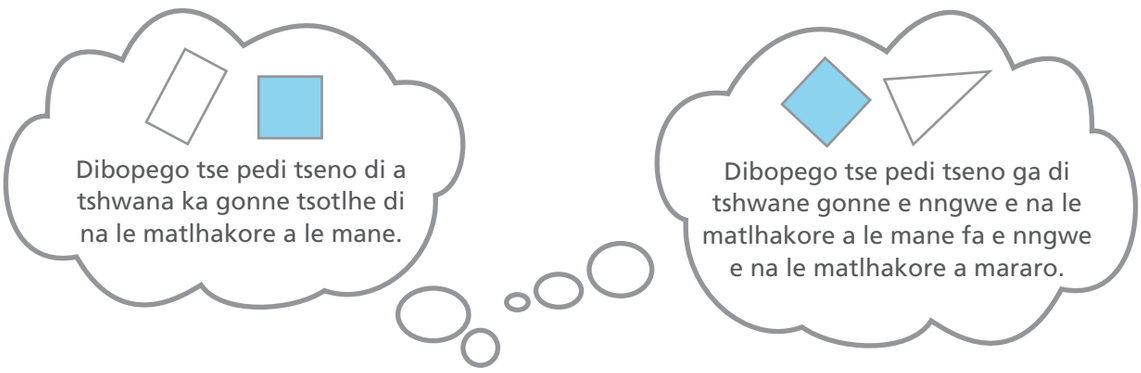
Learners play in pairs. One learner hides a shape or object behind her/his back and the other learner asks questions about it until she/he can guess what it is. 'Is it flat? Does it have three sides?'

Teachers can challenge learners to make as many different shapes as possible on a geoboard.

Neela barutwana ditšhono go tlhotlhomisa dibopego tsa 2-D ka nako ya ditirwana tsa barutwana ka nosi. Dira gore go nne le didiriswa tsa mefutafuta – dibopego tsa polasetiki (dibolokoponagalo) le dibopego tsa khaboto tsa mebala le bogolo jo bo farologaneng – mme o rotloetse barutwana go di dirisetsa go tlhama dipaterone, ditshwantsho le ditlhagiso tse di bonolo. Ka nako ya ditirwana tseno, barutabana ba ka buisana le barutwana gore ba dirang le go ba botsa dipotso tse di rotloetsang jaaka: 'Mpolelela ka ga paterone e o e dirang.' 'Ntlo eo e ntle tota, o e agile jang? Tlhalosetsa molekane wa gago dikgato.'

Fa barutwana ba Mophato R ba simolola go tlhotlhomisa le go tlhalosa dibopego le dipopego, go le gantsi ba dirisa puo ya letsatsi le letsatsi jaaka sephaphathi, boleta, bomotsu. Barutabana ba ka ba thusa go ithuta go tota mela ya sebopego kgotsa popego ka iketlo le go dirisa tlotlofoko ya dipalo go emisetsa ya letsatsi le letsatsi – matlhakore, kgogoropo, tlhamaletse, sekhutlo.

Go tlhaloganya dipharologantsho tsa dibopego ga barutwana go gola fa ba kgona go lemoga **dipharologano** le **dintlhatshwano** magareng ga dibopego. Seno se ka dirwa ka go rulaganya le go arologanya ditirwana le ka go nyalanya ditirwana jaaka go swetsa gore a mme sebopego se tlaa lekana mo malepeng kgotsa mo kagong, kgotsa mo go tshamekeng lotho ya sebopego.



Setshwantsho 76 Dipahorologantsho le dintlhatshwano tsa dibopego

Ka go ikatisa ...

Go tswa go 3-D go ya go 2-D

Sala barutwana le dilo dingwe morago mo phaposiborutelong go bona le go bua ka 'setshwantsho' se se bopilweng. Barutwana ba ka ina dilo mo penteng le go di gatelela mo pampiring go dira kgatiso. Gape ba ka rala matlhakore a dilo le go bua ka mola le sebopego se ba se dirang. Dijana, dibolokokago, dipampiri tsa ntlwanaboithusetso le didiriswa dingwe le dingwe tse di kileng tsa dirisiwa di ka dirisiwa go tlhama ditshwantsho tsa dibopego ka tsela e.

Metshameko ya popego

Barutwana ba tshameka bobedi ka bobedi. Morutwana o mongwe o fitlha dilo kgotsa sebopego mo morago ga gagwe fa yo mongwe a botsa dipotso ka ga sona go fitlhelela a kgona go fopholetsa gore ke eng. 'A se sephaphathi? A se na le matlhakore a mararo?'

Barutabana ba ka gwetlha barutwana go dira dibopego tse di farologaneng mo go kgonagalang mo botofatsheng.

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?'

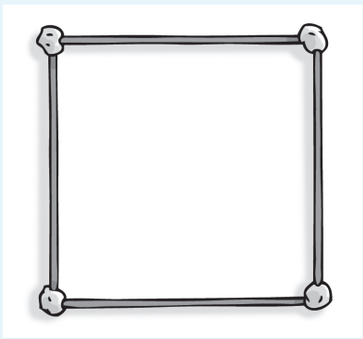


Figure 77 Building shapes

Construct shape pictures

Learners can use attribute blocks to create a picture.

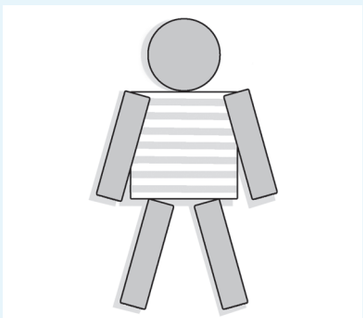


Figure 78 A shape picture

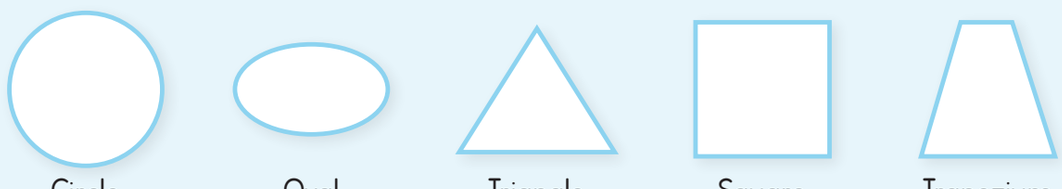
They can glue cut-out shapes onto paper to form other shapes or pictures.

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.

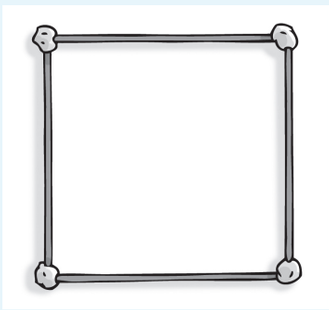
In higher grades learners will learn about a range of 2-D shapes. Learners in Grade R will often ask teachers and adults what a shape is called and the diagrams below provide a reference for these instances.



Aga le go tlhatlhamolola dibopego

Fa barutwana ba ka lemoga dibopego tsa 2-D (khutlonne, sediko, khutlotharo, khutlonnetsepa) le dilo tsa 3-D (mabokoso le dikgwele), ba ipaakanyeditse go aga le go tlhatlhamolola dibopego:

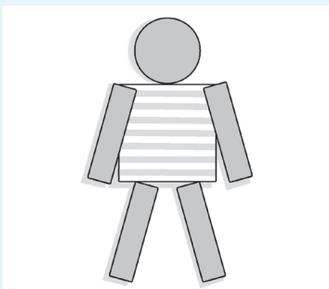
- Disetroo, dithobane le didiriswa tse dingwe di ka dirisiwa le tege go dira dibopego.
- Kopa barutwana go dira dibopego le go buisana ka tsona. 'Seo ke khutlonne. A o ka e fetolela go khutlotharo?'



Setshwantsho 77 Go aga dibopego

Aga ditshwantsho tsa dibopego

Barutwana ba ka dirisa dibolokoponagalo go tlhama setshwantsho.



Setshwantsho 78 Setshwantsho sa sebopego

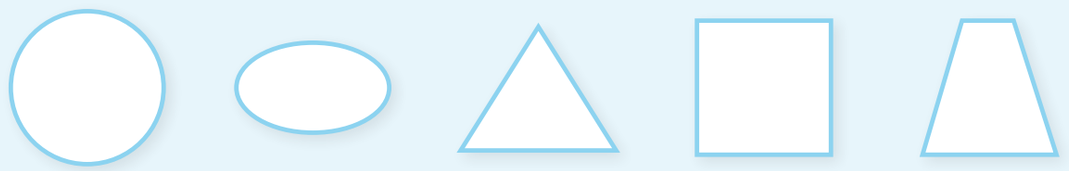
Ba ka kgomaretsa dibopego tse di segilweng mo pampiring go bopa dibopego tse dingwe kgotsa ditshwantsho.

Ba ka kgokolosa, tlhaba le go gatelela tege go dira dibopego le go di kopanya go bopa dibopego tse diswa.

Diphetogo

Barutwana ba a reledisa, le go retolola dibopego fa ba rarabolola dipalo tse di akaretsang dibopego jaaka go nyalanya dibopego mo ditshwantshong le go kopolola dipaterone tsa sebopego ka go dirisa dibolokoponagalo.

Mo Mephatong e e kwa godingwana barutwana ba tlaa ithuta ka ga dibopego tsa 2-D. Barutwana mo Mophatong wa R ba tlaa botsa barutabana le bagodi gangwe le gape gore sebopego se bidiwang mme dithalo tse di latelang fa tlase di tlamela ka tshupetso ya ditiragalo tse.



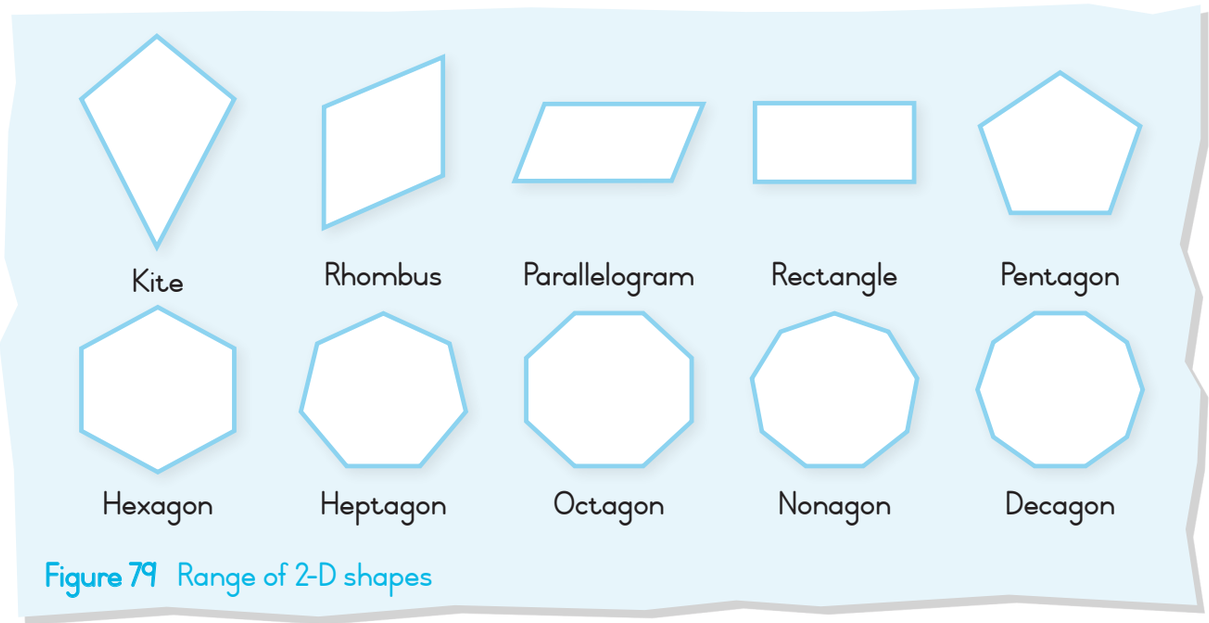


Figure 79 Range of 2-D shapes

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.

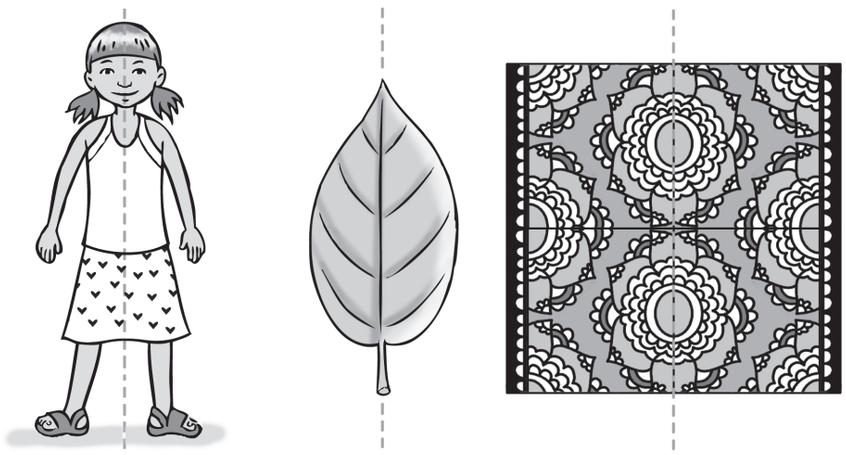
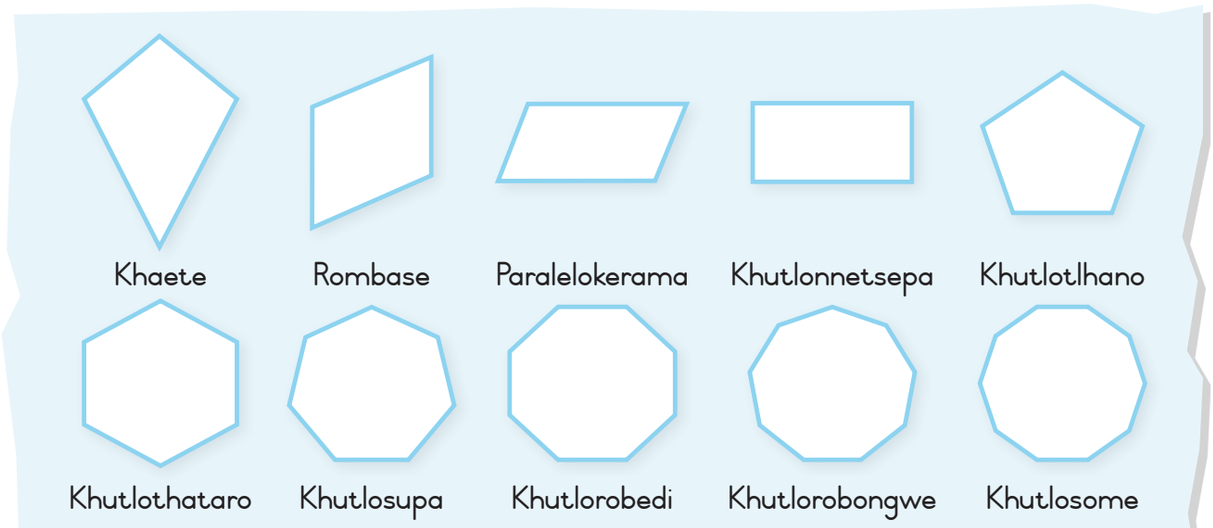


Figure 80 Line symmetry divides the shape into two identical parts.

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.



Setshwantsho 79 Mefuta ya dibopego tsa 2-D

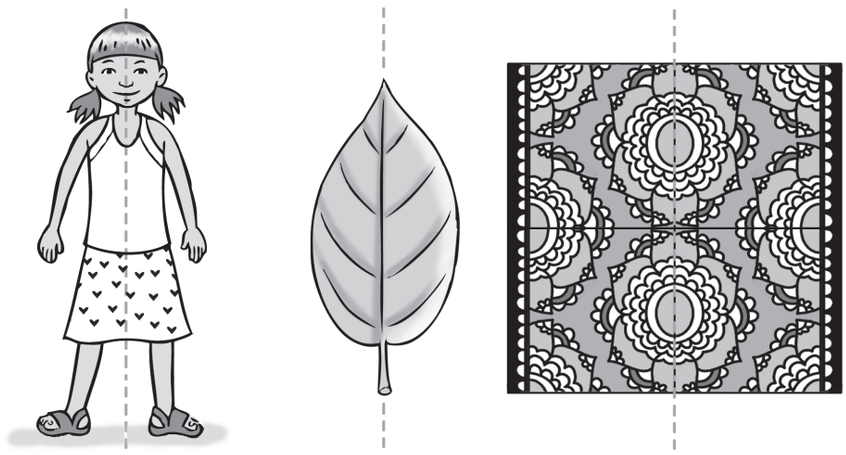
Tekano

Barutwana ba ka lemoga dipaterone tse di lekanang tse di ba dikologileng, mo dikagong le mo dibopegong. Mo malobeng, **tekano** e tlhaloganngwa bonolo jaaka 'tshupotshwano' kgotsa 'seipone'. Barutwana ba ka tlhotlhomisa mogopolo ka go mena le go sega dibopego le ditshwantsho ka bogare, kgotsa ka go rala setshwantsho mo seripeng se sengwe sa pampitshana ka go dirisa dikherayone tse di mafura, mme ba mene pampiri le go tshasa karolo mo morago ga sethalo le go bona khopi e e tshwanang le se ba se thadileng se tlhageletse mo seripeng se sengwe sa pampiri.

LENAANEFOKO

tekano
fa sebopego kgotsa popego se ka arolwa ka bogare ka diripa tse pedi tse di tshwanang

Dipaterone tse di lekanang di ka fitlhelwa mo mebeleng ya rona, mo tlhagong, mo tikologong le mo ditshwantshong. Tekanomela e arola sebopego ka dikarolo tse pedi tse di lekanang. Mola e ka nna o o rapaletseng kgotsa o o tsepameng.



Setshwantsho 80 Tekanomola e arola sebopego ka dikarolo tse pedi tse di lekanang.

Mo Mophato R, barutwana ba tlhotlhomisa tekano ka go bapisa dilo le ditshwantsho. Ba ithuta gore tekano ga se ka ga go 'tshwana le' mme ke ka ga go tshwana, sekao, serurubele se a lekalekana mme seatla sona ga se lekalekane.

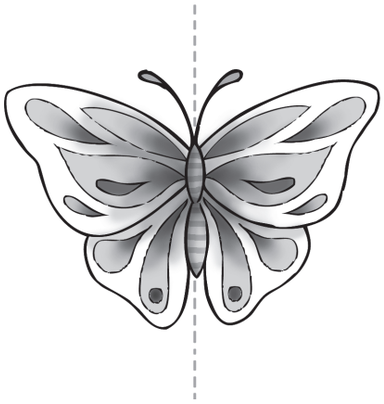


Figure 81 Symmetrical

Figure 82 Not symmetrical

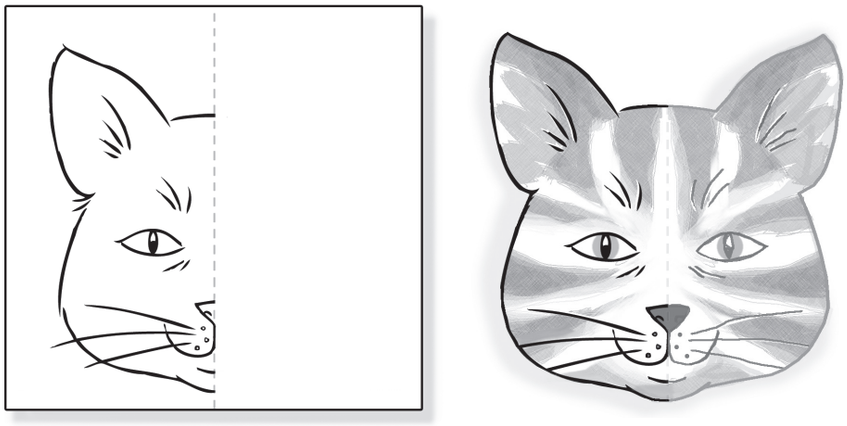
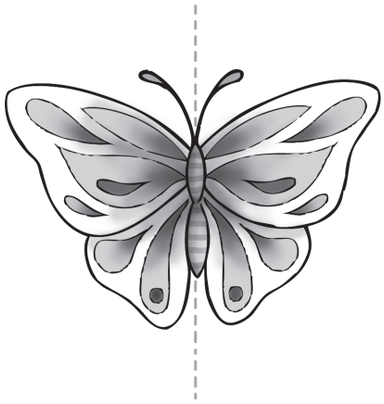


Figure 83 Folded piece of paper with image cut out and copied opposite to show symmetry.

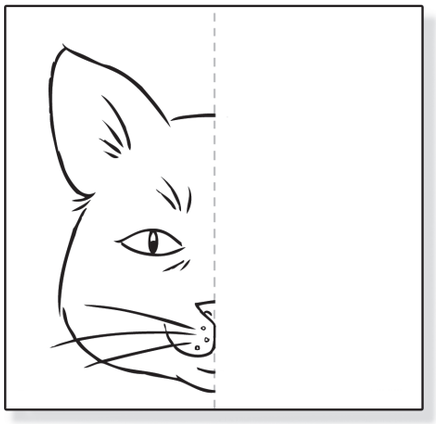
Questions to ask for Space and Shape (Geometry)

- 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?



Setshwantsho 81 Lekalekanang

Setshwantsho 82 Go sa lekalekaneng



Setshwantsho 83 Pampitshana e e menilweng e na le se setshwano se se segilweng le go kopololwa kwa morago go bontsha tekano.

Dipotso tse o ka di botsang ka Boalo le Popego (Jeometeri)

- O eme kae?
- Ke eng se se fa pele/morago ga gago?
- A o ka mpolelela gore ke tswa jang kwa … go ya …?
- A o ko mpontsha gore o ka tsamaya jang go dikologa lebokoso, mo godimo ga setulo le mo tlase ga tafole?
- Sebopego se ke sefe?
- O itse jang gore ke khutlotharo/khutlonne/khutlonnetsepa/sediko?
- Sebopego se se na le matlhakore a le makae?
- Sebopego seno se na le dikhutlo/dintlhana tse kae?
- O ka reng ka matlhakore a sebopego se?
- O ka reng ka mola?
- Ke eng se se tshwanang/farologaneng ka dibopego tse pedi tseno?
- Goreng e le tsa lesaka le le lengwe?

- 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

- A go na le sengwe mo phaposiborutelong se se tshwanang le sebopego seno?
- Go ka diragalang fa ke retolosa sebopego se? Go ka diragala eng fa nka retolosa sebopego seno?
- A o ka dirisa dibopego tseno go dira sekai sa setshwano seo?
- Ke difе tsa dilo tseno tse di kgokologang/relelang?
- A o ka tlhatlaganya dilo tseno?
- A dibopego tseno di ka nyalelana?
- A o bona selo sa matlhakore a a sephaphathi?
- A o bona selo sa matlhakore a a kgogoropo?
- Lebokoso le na le matlhakore/dikhutlo/dintlhana di le kae?
- Ke eng se se tshwanang/farologaneng mo mabokosong a mabedi ano?

Tlotlofoko ya Boalo le Popego (Jeometeri)

Maemo le kaelo

- mo, mo go, go tswa, mo godimo ga, go feta, mo tlase, go tswa go, godimo, tlase, fa tlase, magareng, fa pele ga, mo morago, gaufi le, kgonamisitswe
- gaufi, kgakala, go bapa, thoko, mo teng, kwa ntle
- gaufi, gautshwane
- kgakala, go feta
- gaufi
- tlhamaletse, retologa
- go potologa, go iphaphatha, mo gare
- go, go tswa go, go ela, kgakala le
- go lebagana
- go ya pele, go ya morago, go ya tlhakoreng
- molema, moja

Dibopego tsa 2-D

- sediko, khutlonne, khutlonnetsepa, khutlotharo
- mola, letlhakore, lethoko, sekhutlo, ntlhana, bogale
- kgogoropo, tlhamaletse

Dilo tsa 3-D

- boloko, lebokoso, tlase, godimo, matlhakore, sephaphathi
- mela, tlhamaletse, lethoko
- sekhutlo, bogale, ntlhana
- kgwele, kgolokwe, kgogoropo

Tekano

- tshwana le
- molema, moja
- godimo, tlase

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.

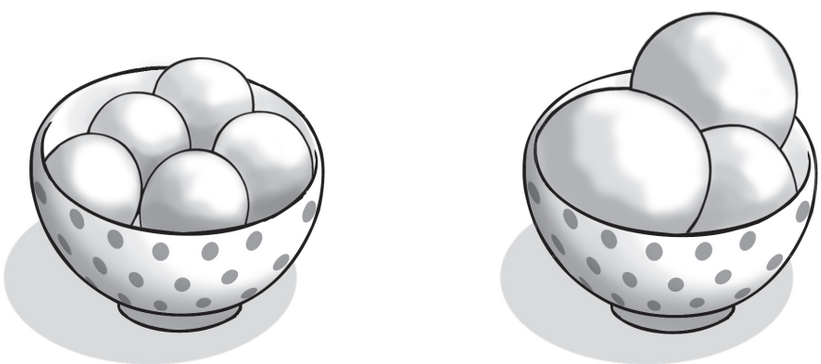


Figure 84 Estimating the amount of ice cream

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.

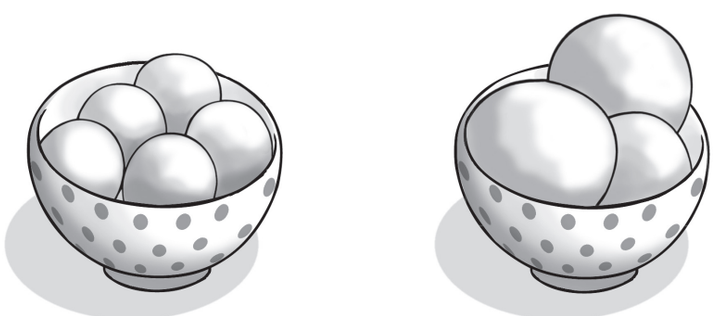
Tekanyo

Bana ba tsaya karolo mo **tekanyong** fa ba tshameka le fa ba tlhotlhomisa mo metshamekong ya letsatsi le letsatsi. Ba tsena mo Mophato R ba na le dikakanyo tsa bona fela ka ga tekanyo, sekao, gore mogolo o 'mogolo', gore sengwe se kwa godimo go se fitlhelela, gore ba tlhoka dilo di le dintsi go tlatsa lebokoso, gore go tsaya nako go fitlha kwa lebenkeleng. Ba tlaa bapisa gore ke monamone efe e kgolo thata mo go tse pedi, ke tora efe ya boloko e telele go gaisa kgotsa ke lefe la mabokoso a mabedi le le bokete thata. Go tlhaloganya megopolo ga ditekanyo tsa mefuta e e farologaneng go gola ka iketlo le go tokafala fa barutwana ba ntse ba tsaya karolo, mmogo le ka maitemogelo a bona a letsatsi le letsatsi le fa ba ntse ba tlotla le bagolo mmogo le ditsala, sekao, ba ka tsaya lenathwana le legolo la borotho kgotsa ba bapisa bogodimo kgotsa ba batlisisa gore ke ofe yo o nang le lenao le le nnnye thata kgotsa gore ke mang yo o dirileng tora e e kwa godimo go gaisa. Ba dira ditshwetso tsa gore ke efe ya dikoloi tse pedi tsa ditshamekisi e tlaa tsenang sentle mo karatšheng le gore ba tlhoka diboloko di le kae go dira karatšhe kgolo kgotsa nnye. Ba ka lekanya ditsompelo tsa go apaya, ka go tshela metsi kgotsa motlhaba go tswa mo jekeng go bona gore go ka tladiwa dikopi tse kae, kgotsa go bapisa gore ke eng se se bokete magareng ga kgetse ya sukiri le lebokoso la dilamune.

Ditekanyo le diyuniti tse re di dirisang go lekanya ke ka ga go batlisisa gore go na le 'bokaakang' jwa selo se se rileng. Tekanyo e golagana le dikarolo tse dingwe tsa dipalo, jaaka dinomore, dipaterone, sebopego le tshedimosetso. Barutwana ba bala gore ke diyuniti di le kae tse di tlhokegang go lekanya dilekanyo tse di bonalang, jaaka bogodimo, mothamo, volumo, boleele, boima, kgotsa selekanyo se se sa bonaleng, jaaka nako, tšhelete kgotsa themphereitšhara. Ba ka lekanyetsa gore ke sefe sa sengwe se leng 'sentsi' kgotsa 'sennye', sekao, dikupu tsa bebetsididi mo sejaneng. Ba tlaa dira tekanyetso ba ikaegile ka bokaakang jwa sebaka jo bo tsewang ke bebetsididi, e seng mo boimeng jwa dijana kgotsa palong ya dikupu.

LENAANEFOKO

tekanyo
'ke bogolo jo bo kana kang' jwa sengwe, sk. bogodimo, boleele, boima, volumo, mothamo



Setshwantsho 84 Go lekanya bokaakang jwa bebetsididi

Mo Mophato R, tekanyo e a diragatswa mme barutwana ba tshwanetse go dira ditirwana tse dintsi tsa botsayakarolo mme e bile di na le bokao mo go bona. Go tlhaloganya megopolo ya tekanyo, sekao, gore selo se 'bokete' go le kana kang, barutwana ba tlhoka go tsholetsa dilo le go bapisa boima jwa tsona. Tekanyo ke ka ga go batlisisa bogolo kgotsa bokaakang jwa sengwe ka go se bapisa le yuniti e e sa tlhomamang, jaaka diatla, dinao, phensele kgotsa mogala o monnye, kgotsa yuniti e e tlhomameng ya tekanyo, jaaka sentimetara kgotsa 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.

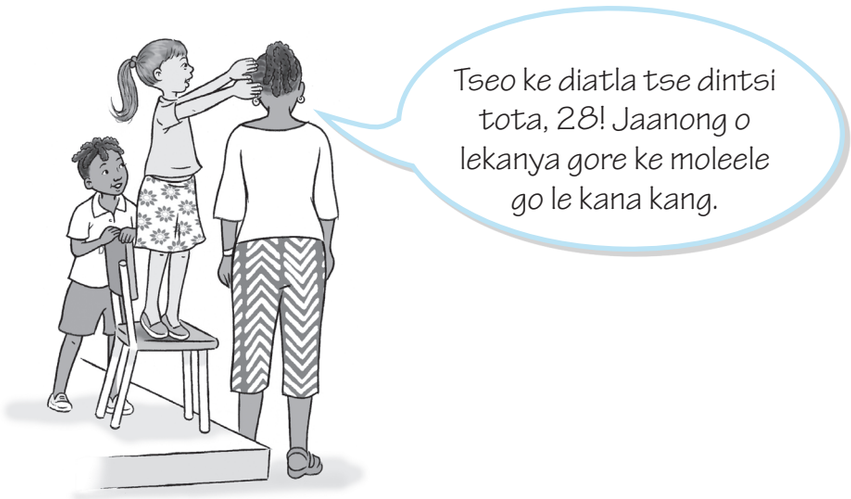
Figure 86 Using hands to measure height

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.

Barutabana ba tlhoka go lemoga barutwana fa ba dira ditirwana le go bua le bona ka ga dikakanyo tsa bona. Barutabana ba ka itsise tlotlofoko e ntšhwa fa barutwana ba bapisa, sekao, dilo di dileele go le kana kang. Fa barutwana ba bua ka ga sengwe gore se 'segolo' kgotsa 'sennye', morutabana o ka nna sekai sa tlotlofoko e e nepagetseng ka go bua mafoko a yona ka tsela e sele. Sekao, fa morutwana a re mongwe o mogolo kgotsa o monnye, barutabana ba tshwanetse go ba rotloetsa gore ba bue gore ke eng se se dirang motho mogolo kgotsa monnye. A ke bogodimo kgotsa bophara kgotsa bogolo jwa mmele jwa motho?

Setshwantsho 85 Go dirisa tlotlofoko ya dipalo

Fa barutwana ba sweditse gore ba batla go lekanya eng (ponagalo) ba tlhoka go swetsa gore ba tlaa lekanya jang ponagalo e e rileng, jaaka bogodimo.



Setshwantsho 86 Go dirisa diatla go lekanya bogodimo

Ka tsela eno, barutwana ba tlaa simolola go tlhaloganya gore dilo tse 'dikgolo' ga se fela tse dikgolo go feta, le gore ba ka di lebelela go ya ka boleele, bogodimo kgotsa boima jwa tsona.

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.

Ka go ikatisa ...

Barutwana gape ba a tlhakanya kgotsa ba a ntsha fa ba rarabolola dipalo tsa tekanyo tse di akaretsang nomore, sekao, fa ba:

- bapisa bokaakang fa ba tshela metsi kgotsa motlhaba mo ditshoding tse di farologaneng, ba tlaa lemoga gore ba tlhoka dikopi tse 2 go tlatsa jeke
- batlisisa gore ke dilo tse kae tse di ka bewang mo matlhakoreng otlhe a sekalamaleka go dira gore matlhakore a lekalekane, ba tlaa lemoga gore ba tlhoka koketsego ka nngwe kgotsa tse di mmalwanyana le go bala palogotlhe
- aga dibolokotora le go tlhakanya, ntsha le go bala palo ya diboloko go dira tora telelenyana kgotsa khutshwanyane.

Go godisa tekanyo ya mogopolo

Barutwana ba tshwanetse go nna le ditšhono tse dintsi go rarabolola bothata bo bo akaretsang tekanyo mme e bile gape ba tlhoka go nna le mefuta ya ditshodi tse di maleba tse ba ka di dirisang mo ditirwaneng tse di sa tlhomamang go itlhotlhomisetsa le go ipatlisisetsa ditharabololo. Barutwana ba tlhoka ditirwana tse ba tsayang karolo mo go tsona tse di akaretsang go bapisa ka go sela, tshela, tshwara le go bua ka ga se ba se itemogelang.

Setshwantsho 87 Ditshodi tsa ditirwana tsa tekanyo

Ditsela tse di farologaneng tsa tekanyo

Papiso ka tlhamalalo

Tekanyo e totile go bapisa ponagalo ya sengwe 'ka tlhamalalo'. Sekao, go lekanya boleele jwa phensele kgatlhanong le phensele e nngwe kgotsa go bapisa bogodimo jwa barutwana ba babedi, ba hulerane.

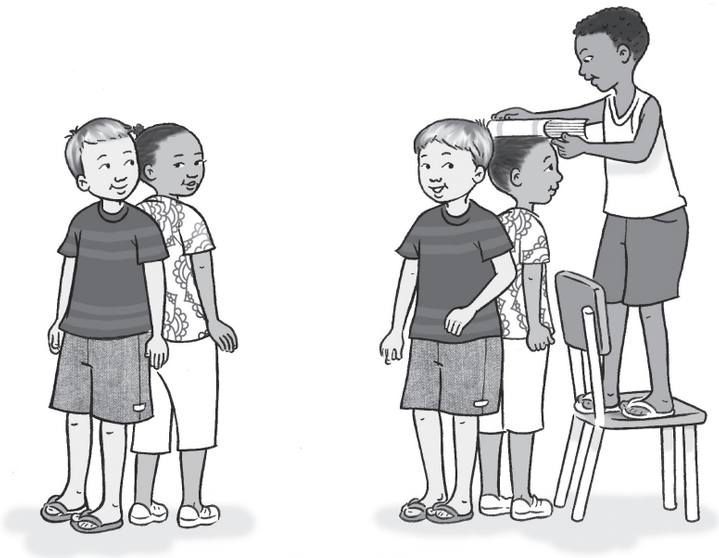


Figure 88 Comparing the height of two learners

'Max is taller than Lola.'
'How much taller is he?'

Comparisons can also involve ordering:
'Max is taller than Lola, but shorter than Elton.'

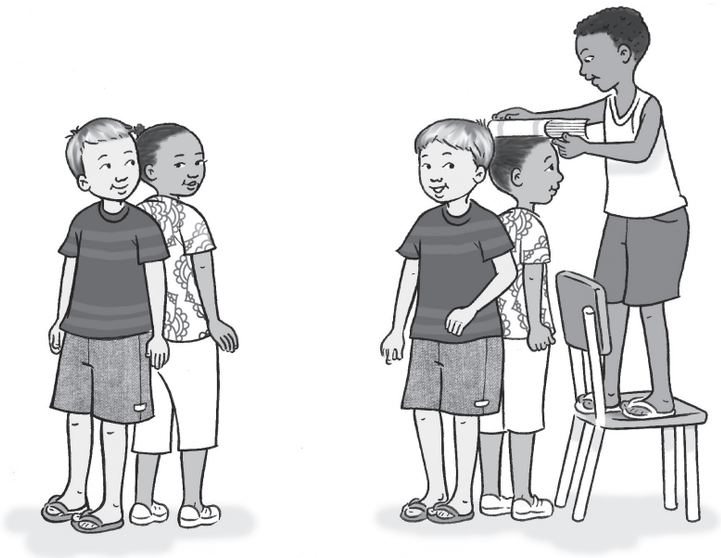
Figure 89 Tallest to shortest

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



Setshwantsho 88 Papiso ya bogodimo jwa barutwana ba babedi

'Max o moleelenyana mo go Lola.'
'O moleelenyana go le kana kang?'

Papiso e ka akaretsa go rulaganya:
'Max o moleelenyana mo g Lola fela o mokhutshwanyane mo go Elton.'

Setshwantsho 89 Telele go gaisa go ya go khutshwakhutshwane

Tekanyo e e sa tlhomamang

Re lekanya mo go sa tlhomamang, re dirisa **diyuniti tse di sa tlhomamang** go lekanya, sekao, fa re dirisa boleele jwa letsogo go lekanya lenathwana la mogala, kgotsa re dirisa dinao tsa rona go lekanya bogolo jwa khapete.

LENAANEFOKO

yuniti e e sa tlhomamang
yuniti ya tekanyo e e dirisang dilo tse di tshwanang le setlhako, setshwarapampiri kgotsa seraro/ khube; go ka dirisiwa gape dilo tse di sa tlhomamang jaaka boleele jwa letsogo, lenao kgotsa mmele

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 tekanyo e e tlhomameng

Re dirisa diyuniti tse di tlhomameng jaaka dimilimitara, disentimitara, dimitara, dikerama, dikilokerama, metsotso le diura go bapisa boleele jwa sengwe, gore selo se boima go le kana kang kgotsa go tsaya nako e kana kang go dira sengwe. Re dirisa diyuniti tse di tlhomameng go lekanya ka nepagalo.

Tekanyetso

Barutwana ba tlhoka go nna le dikgono tsa go lekanyetsa ka nako ya ditirwana tsa bona tsa go lekanya go go sa tlhomamang, sekao, ba tshwanetse go lekanyetsa gore ba akanya gore selo se bokete go le kana kang pele ga ba se lekanya, kgotsa ba akanya go fitlha kae gore sengwe se ikaegile mo palong ya diboloko tse ba akanyang gore ba a di tlhoka go se lekanya, kgotsa ba akanya gore go ya go tsaya nako e kae go fetsa phepafatso ya phaposiborutelo. Jaanong ba dirisa didiriswa tsa go lekanya go batlisisa gore ditekanyetso tsa bona di nepagetse go le kana kang.

Ka go ikatisa ...

Barutwana ba simolola go tlhaloganya gore tekanyo ke eng le gore goreng re tlhoka go lekanya. Ba tlhaloganya go re:

- Tekanyo e akaretsa papiso ka tlhamalalo le tiriso ya diyuniti tse di sa tlhomamang, jaaka diatla le dinao, le gore diyuniti tse dingwe di tshwana ka bogolo kgotsa boleele jaaka diboloko, mogala, disetroo tsa go bala.
- Yuniti e nngwe le e nngwe e farologane ka bogolo; ba lemoga gore tekanyo nngwe le nngwe e ntsha poelo e e farologaneng.
- Re dirisa yuniti e e tlhomameng e le nngwe go lekanya gore rotlhe re nne le poelo e e tshwanang fa re bapisa ponagalo.

Barutwana ba tlhoka ditšhono tse dintsi go tsaya ditshwetso mabapi le se se ka lekanngwang le gore jang. Ba tshwanetse go bapisa dipoelo tsa ditekanyo tsa bona le go dirisa diyuniti tse di farologaneng go lekanya dilo tse di tshwanang.

Mo mephatong e e kwa godingwana fa barutwana ba iponetse dikgono tsa go bapisa le go lekanyetsa, ba simolola go dirisa diyuniti tse di tlhomameng. Barutwana bangwe ba Mophato R ba ka neelwa tšhono ya go lekanya didiriswa kwa lapeng mme tseno di ka buisanelwa e seng ka tlhomamo kwa dikolong, sekao:

- dijeke tse di lekanyang, maswana a a lekanyang – go lekanya dimililitara, dilitara
- dirula, ditheipe tsa go lekanya – go lekanya disentimetara, dimitara
- dikale – go lekanya dikerama, dikilokerama
- diwatšhe le ditshupanako tsa lebota – go lekanya metsotso, diura.

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.

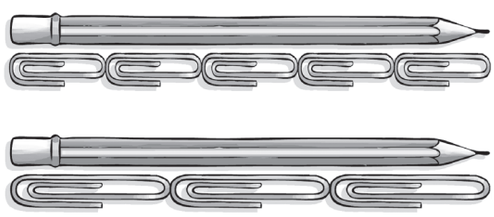


Figure 90 Measuring length with two different units of measurement

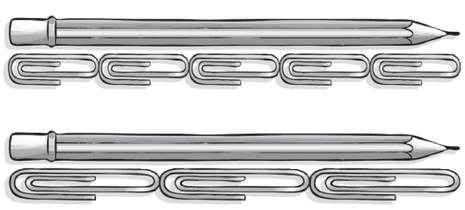
Nako

Karolo ya tiragatso ya tekanyo – sekgala, mothamo, bokete – e ka tlhagisetswa barutwana ka go dirisa ditirwana le ditiragalo tse di tlwaelegileng, fela nako ke mogopolo o o sa bonaleng o barutwana ba tshwanetseng go o tlhaloganya. Sengwe se se nang le seabe mo go seno ke go re bagolo ga ba dirise puo ya nako ka nepo go le gale, le go dirisa dipolelo tsa letsatsi le letsatsi jaaka, 'Ke tlaa bo ke le koo mo motsotsong o le mongwe,' mme ba bo ba tsaya nako e telele go feta foo. Gape bana ba bannye ba na le go tshela 'ka nako eo' mme fa go le jalo ba gopole ditiragalo tse di fetileng gore ba kgone go bonela ditiragalo tsa isago pele go ba thatafalela thata fela. Barutwana ba tlhoka go tlhaloganya gore nako e tsamaya jang mo matshelong a bona gore barutabana ba tlhoka go bapisa nako le maitemogelo a bona a letsatsi le letsatsi le ditiragalo tse ba di tlwaetseng.

- Go latedisanya ditiragalo: Barutwana ba tlhoka go tlhaloganya puo ya nako gore ba tle ba bue ka thulaganyo e tatelano ya ditiragalo e tsamayang ka yona. Go dirisa ditlwaelo tsa letsatsi le letsatsi go bua ka thulaganyo ya ditiragalo mo letsatsing le tatelano ya ditiragalo go feleletsa tirwana – 'go diragetseng gape/pele/morago'.
- Diyuniti tsa nako: Bapisa diyuniti tse di farologaneng tsa nako: nako ya sekolo ke mo mosong, nako ya lelapa ke thapama, nako ya go robala ke bosigo, 'masigo' a mabedi go fitlha mo letsatsing la gago la botsalo. Dira tšhate ya maemo a bosa, tshola khalentara ya kgwedi le kgwedi mme o rekote ditiragalo tse di botlhokwa mo papetlanakong ya tshwantsho. Bua ka 'maabane, gompieno, ka moso'. Barutwana ba simolola go tlhaloganya gore nako e aga jang malatsi a beke, dikgwedi tsa ngwaga le ditlha ka iketlo.
- Dikelo tsa lebelo: Taboga le go tlhoma lebelo kwa ntle. Dirisa mekoro ya polasetiki go dira metlhala go kgokolosa dimmabole le dirempe go kgorometsa dikoloi go ya kwa godimo le kwa tlase. Binela mmino o o iketlileng le o o itlhaganetseng. Botsa barutwana gore go ba tsaya nako e kae go tlhapa meno kgotsa go potologa sekolo. Bua ka metsamao le ditirwana tse di bonako, tse di itlhaganetseng le tse di bonya.

Boleele

Mo Mophato R, go totilwe tekanyetso, go lekanya, go bapisa le go rulaganya boleele le sekgala. Barutwana ba tlhoka go tlhaloganya gore go re ba kgone go batlisisa boleele jwa sengwe ba tlhoka go bo lekanya go tswa mo ntlheng e nngwe go ya go e nngwe. Sekao, ba ka lekanya le go bapisa boleele jwa phensele ka go dirisa ditshwarapampiri jaaka diyuniti tse di sa tlhomamang. Tlhagiso e e fa tlase e bontsha gore phensele e ka lekanngwa jang ka go dirisa diyuniti tse pedi tsa tekanyo. Mo setshwantshong sa ntlha go na le ditshwarapampiri tse tlhano mme mo setshwantshong sa bobedi go na le ditshwarapampiri di le tharo tse dikgolo thata.



Setshwantsho 90 Go lekanya boleele ka diyuniti tse pedi tse di farologaneng tsa tekanyo

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

Barutwana gape ba ka lekanya go tswa kwa godimo go ya kwa tlase go batlisisa boleele jwa sengwe, sk. go batlisisa gore barutwana ba ba mo phaposiborutelong ba baleele go le kae. Jaanong o ka ba rulaganya go simolola ka ba baleele thata go ya go ba bakhutshwanyane.

- Papiso ka tlhamalalo: Batlisisa dilo tse dileelenyana/khutshwanyane go na le … Rulaganya dilo go latela boleele le bogodimo. Bua o bo o tlhalose gore goreng dilo di rulagantswe ka tsela e e rileng.
- Diponagalo: Bua ka boleele, bogodimo kgotsa bophara jo bo tshwanetseng go lekanngwa.
- Diyuniti tse di sa tlhomamang: Dirisa diatla, matlhare, diphensele go lekanya le go bapisa dilo.
- Diyuniti tse di sa tlhomamang e bile di sa tshwane: Dirisa yuniti ya bogolo jo bo tshwanang, sekao, diboloko. Baya tseno go latela boleele jotlhe jwa selo jo bo lekanngwang. Moragonyana dirisa boloko bo le bongwe mme o bo tsamaise, o bala palo ya motsamao.

Boima

Mo Mophato R go totilwe go lekanyetsa, go kala, go bapisa le go rulaganya dilo go ya ka gore di bokete kgotsa botlhofo go le kae. Go tsaya nako gore barutwana ba tlhaloganye gore mogopolo wa gore bogolo le boima (kgotsa bokete) di farologane. Barutwana ba tlhoka go tlhotlhomisa dilwana tse di bokete, dilwana tse di botlhofo, dilo tse di kgolo mme di le bokete le go dira dipapiso magareng ga tsona. Barutabana ba tshwanetse go thusa barutwana go tota gore selo se bokete go le kae, e seng bogolo.

- Papiso ka tlhamalalo: Tshwara selo mme o lekanyetse **boima** jwa sona. Batla dilo tse di boketenyana kgotsa botlhošwana go na le tse dingwe.
- Diponagalo: Bua ka popego, bogolo le boima jwa selo se se lekanngwang.
- Diyuniti tse di sa tlhomamang: Dirisa sekalamaleka go bapisa boima jwa dilo. Baya selo se se tshwanetseng go kalwa mo letlhakoreng le lengwe la sekala. Baya selo (kgotsa go feta nngwe) se sengwe mo letlhakoreng le lengwe la sekala go se dira maleka.
- Diyuniti tse di sa tlhomamang e bile di sa tshwane: Dirisa yuniti e e tshwanang ya bogolo, sekao, boloko e kgolo kgotsa buka go bapisa boima jwa dilo ka go dirisa sekalamaleka.

LENAANEFOKO

boima
sengwe se boima go le kae

Mothamo

Mothamo wa selo ke gore se ka tshola go le kae, sekao, litara ya lebotlolo la maswi e ka tshola litara ya seedi. Mo Mophato R, go totilwe tekanyetso, go lekanya, go bapisa le go rulaganya ditshodi go ya ka gore di ka tshola go le kae. Barutabana ba tlhoka go tlamela barutwana ka ditšhono tse dintsi go dirisa megopolo ya lolea le go tlala, sk. fa ba tlatsa ditshodi ka metsi kgotsa motlhaba le fa ba tsholola go di dira lolea le ka nako ya seneke. Barutwana ba ka tlatsa ditshodi tse di nang le dilo tse di farologaneng le go bua ka mothamo wa tsona: 'Re tlhoka dikopi tse kae tsa metsi go tlatsa jeke eno? Goreng re tlhoka mabotlolo a le mmalwanyana a metsi go tlatsa jeke?'

LENAANEFOKO

mothamo
mothamo tlalo kgotsa bokaakang jo bogolo oo sengwe (jaaka kgamelo kgotsa lebokoso, kgotsa setediamo) se ka o tsholang bonnye

- 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

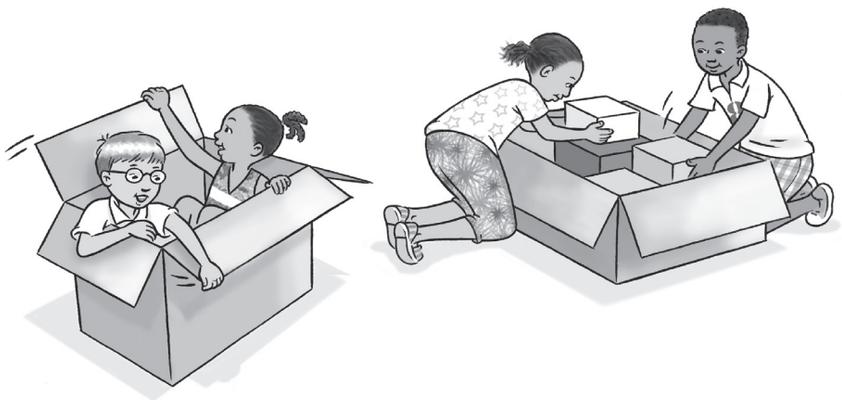


Figure 91 Exploring capacity and volume

- 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?'

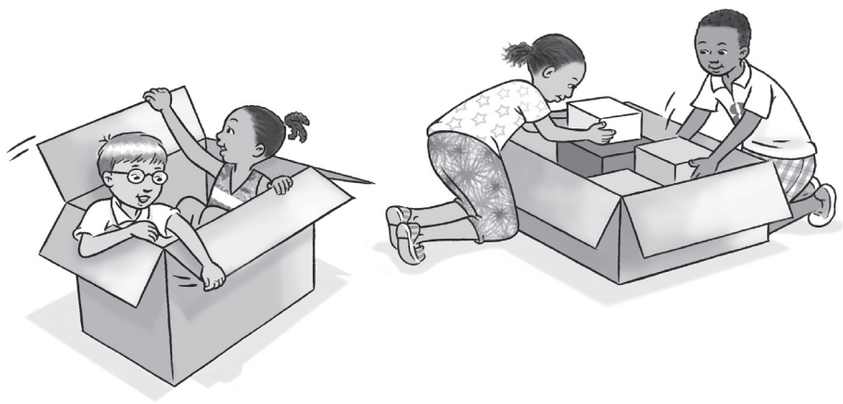
- Papiso ka tlhamalalo: Tlatsa, tsholola o tshele magareng ga ditshodi tse di tshwanang ka go dirisa metsi kgotsa motlhaba go batlisisa gore a di tshola bokaakang jo bo tshwanang. Kwa tshimologong, barutwana ba ka lekanyetsa gore setshodi se se leejana mo go tse pedi se tlaa tshola metsi a mantsi.
- Diyuniti tse di sa tlhomamang: Lekeletsa ka gore ditshodi tse di farologaneng di ka tshola bokaakang jwa metsi kgotsa motlhaba. Bapisa gore ke efe e e tsholang 'go le gontsi' kgotsa 'go le gonnye'. Tlatsa setshodi se sengwe mme o tshele metsi kgotsa motlhaba mo go se sengwe go bona gore a se tlaa o tsholola kgotsa a go sa ntse go ka tsena sengwe. Tlatsa ditshodi tse di leele le tse di bulegileng mme o di rulaganye go ya ka se se tsholang go le gontsi thata mme go latela se se tsholang go le gonnye.
- Diyuniti tse di sa tlhomamang mme di tshwana: Bala palo ya maswana kgotsa dikopi tse di tlatsang ditshodi tsa bogolo jo bo tshwanang jo bo farologaneng.

Volumo

Volumo ke ka ga gore selo se ka tshola go le kana kang, jaaka metsi, motlhaba, raese kgotsa sukiri. Mo Mophato R, tekanyo e tshwanetse go tota gore setshodi se ka tshola go le kana kang (mothamo) go na le bokaakang jwa sebaka jo setshodi se bo tsayang (volumo). Volumo e ka fetoga go latela bokaakang jwa diteng nako nngwe le nngwe, fela mothamo ona o a tshwana ka gale, sekao, mothamo wa jeke ke litara e le 1 go sa kgathalasege gore e na le go le kana kang ka nako eo. Seno ke mogopolo o o thata go ka tshwarelelwa ke barutwana ba Mophato R.

LENAANEFOKO

volumo
bokaakang jwa sengwe kgotsa sebaka se se tswalwang ke diteng



Setshwantsho 91 Go tlhotlhomisa mothamo le volumo

- Papiso ka tlhamalalo: Barutwana ba lekeletsa ka ditshodi tsa dipopego tse di farologaneng go batlisisa gore setshodi se segolo go le kana kang le gore se ka tshola go le kana kang.
- Diyuniti tse di sa tlhomamang: Ditshodi tse di kokobalang jaaka dikhafothini, ditshodi tsa polasetiki tsa pinabatha, dijeke tsa maswi mo metsing. Ditlatse ka dibadi kgotsa motlhaba mme lo buisane ka se se diragalang. Botsa dipotso tse di jaaka: 'A di sa ntse di kokobala? Go diragalang ka metsi a a mo kgamelong? A a a tshologa?'

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

Dipotso tse o ka di botsang mo Tekanyong

- O dirileng fa o tsoga?
- O bo o dirang gape?
- Ga diragalang morago ga moo?
- Re dirileng pele …?
- Re tlaa dirang morago …?
- Ke sefe se se tsamayang thata ka bonako/bonya?
- … ke letsatsi lefe? … e tlaa bo ne le letsatsi lefe?
- Ke efe e telele/khutshwane thata?
- Ke efe e e boima/botlhofo thata?
- … e ka tshola dikopi/maswana/mabotlolo a le kae?
- Ke setshodi sefe se se ka tsholang go feta seno?
- Ke setshodi sa ga mang se se nang le mothamo o o gaisang thata? O itse jang?
- Tota ke nyorilwe. Nka dirisa kopi efe? Goreng?

Tlotlofoko ya Tekanyo

- nyalanya, rulaganya, bapisa, latedisanya
- lekanya, go tshwana le

Nako

- pele, morago, latelang, jaanong, morago
- ka bonako, ka iketlo
- letsatsi, bosigo, mosong, thapama
- gompieno, maabane, ka moso
- beke, letsatsi la beke
- kgwedi, dikgwedi tsa ngwaga
- khalendara
- ngwaga, letlha
- letlhabula, mariga, dikgakologo, selemo, ditlha

Boleele

- boleele jo bo kae, khutshwane, atlhame, telele
- telejana, leelenyana, khutshwanyane, atlhamenyana
- khutshwakhutshwane go ya go leele go gaisa, leele go gaisa go ya go khutshwakhutshwane

Boima

- bokete, boketenyana, boketekete
- botlhofo, botlhošwana, botlhofotlhofo

Mothamo

- feta, tlase, lolea, tletse

Volumo

- kgolo, nnyane, kgolo thata, nnye, tshesane

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.

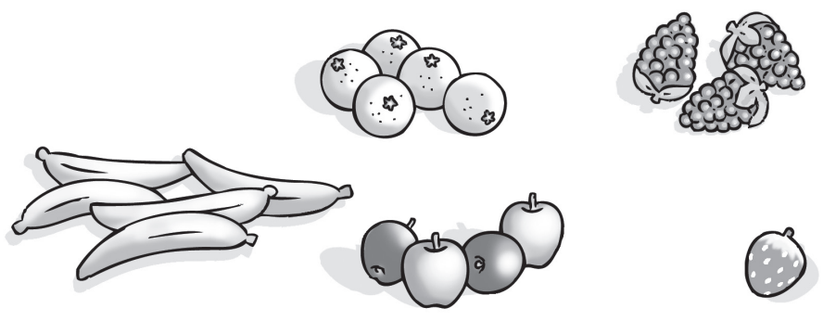


Figure 92 Collecting, sorting and organising into groups

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.

Go Ranola Tshedimosetso

Bana ba bannye ba botsa dipotso fa ba leka go batla bokao jwa lefatshe le ba tshelang mo go lona. Barutabana ba tlhoka go rotloetsa barutwana mo Mophato R go botsa dipotso le go batla ditlhaloso. Dipotso tseno di ka dirisiwa jaaka motheo wa go kokoanya tshedimosetso (dinewa) le go batlisisa ka ga dilo kgotsa ditiragalo.

Go rulaganya le go arologantsha

Barutwana ba tswelela go rulaganya le go **arologantsha** dilo tse di ba potologileng ka tlhomamo. Ba baya dilo ka ditlhopha tse di farologaneng go latela mebala le bogolo, ba paka dilo le go di pakolola kwa lapeng le kwa gae, ba di rulaganya ka dingatana tsa sebopego le tiriso e e farologaneng, sekao:

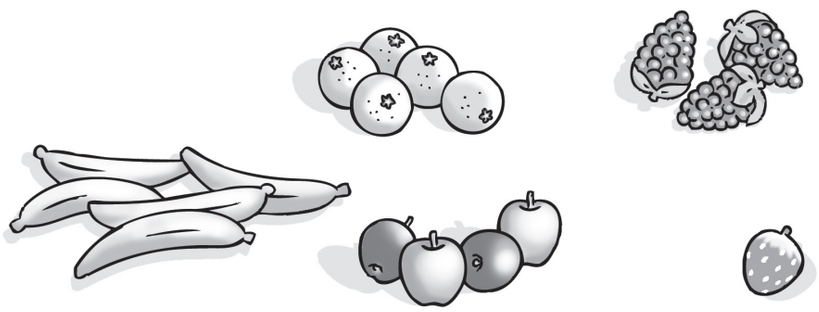
- go rulaganya le go nyalanya ditlhopha tsa dilo: dikousu, ditlhako, dipoleite, dikopi
- go paka dilo: meteme, mabokoso, mabotlolo, dibadi
- go rulaganya dibadi kgotsa ditshamekisi go ya ka diponagalo: mmala, bogolo, mofuta
- nako ya go phepafatsa: dibuka, diboloko, diphazele, metshameko, dikherayone.

LENAANEFOKO

arologantsha
tsamao ya go baya dilo tse di tshwanang ka ditlhopha ka tsela e e lolameng, sk. go aroganya diaparo tsa mariga le tsa selemo

Dilo di ka rulaganngwa le go arologanngwa go ya ka dintlhatshwano, jaaka mmala. Kitso e barutwana ba nang le yona ka ga dipharologantsho tsa dilo jaaka dimela le dipholologolo, le ditshwano le dipharologano tsa tsona, e tlaa ba kgontsha go di aroganya ka ditlhopha tse di farologaneng.

Go Ranola Tshedimosetso go akaretsa go kokoanya, go rulaganya le go tlhagisa mmogo le go ranola tshedimosetso go kgona go rarabolola palo kgotsa go araba potso, sk. 'Ke barutwana ba le kae ba ba ratang go ja diapole?' Gore ba kgone go araba potso eno, barutwana ba tlhoka go kokoanya tshedimosetso, go e rulaganya le go e tlhagisa ka tsela e e tlaa dirang gore go nne bonolo go e ranola ka maitlhomo a go araba potso.



Setshwantsho 92 Go kokoanya, go rulaganya le go baya ka ditlhopha

Go Ranola Tshedimosetso e ka golagana le dikarolo tse dingwe tsa go ithuta, sekao go batlisisa ka ga:

- lefatshe le le re potologileng, ka go lebelela le go rekota maemo a bosa a letsatsi le letsatsi kgotsa go kokoanya mefuta e e farologaneng ya matlhare
- dikgatlhego tsa sebele, jaaka mmala o o ratiwang
- dijo tse di itekanetseng, jaaka maungo le merogo.

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.

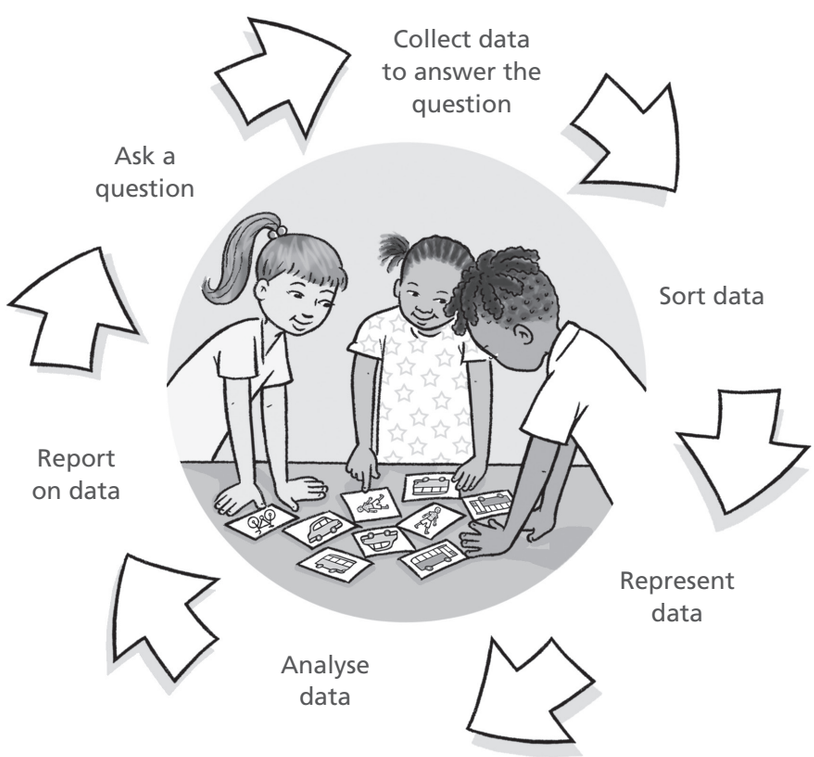


Figure 93 The Data Handling cycle

Go lemoga diponagalo

Kwa tshimologong, barutwana ba rulaganya le go arologanya dilo go ya ka ponagalo e le nngwe, jaaka mmala, bogolo kgotsa popego. Ba ka tswelela go neela mabaka a gore goreng ba beile dilo ka ditlhopha tse di rileng. Gape ba ka akanya ka ditsela tsa go baya dilo tseo ka ditlhopha tse dingwe, go latela ponagalo e e farologaneng le ya pele. Fa barutwana ba tlhotlhomisa le go bua ka gore ba kokoanya jang 'dilo' le go di rulaganya, ba simolola go baya dilo ka ditlhopha go latela ponagalo e e fetang bongwe, jaaka mmala le popego ya dilo.

Ka go ikatisa ...

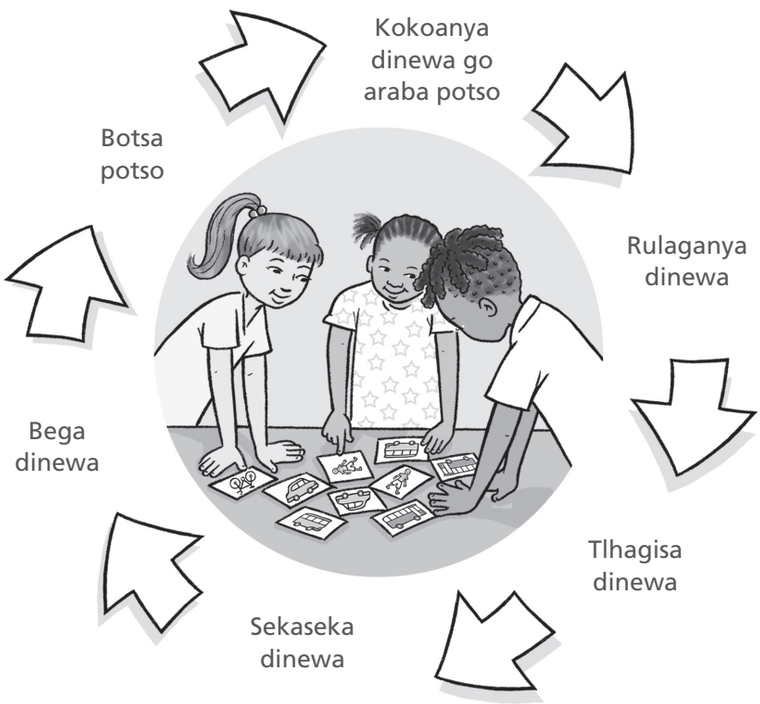
Morutabana a ka laela barutwana go rulaganya dilo tse di kokoantsweng ka dibopego tsa mebala e e farologaneng:

- Batla dibopego tsotlhe tse ditala.
- Batla dikhutlonne tsotlhe.
- Batla dikhutlonne tse ditala.

Go rulaganya ka diponagalo tse pedi go gwetlha barutwana ka gonne ba tshwanetse go tlhaloganya pharologanyo magareng ga ditlhopha tse tharo. Tse pedi tsa ditlhopha di na le ponagalo e le nngwe fela fa setlhopha sa boraro se na le diponagalo tse di dirang gore se nne maleba mo ditlhopheng tsotlhe.

Tsheko ya Go Ranola Tshedimosetso

Go le gantsi batho ba lebelela tsamao ya Go Ranola Tshedimosetso jaaka tsheko gonne ditiragalo kgotsa ditirwana tse di dirwang di boelediwa mo tatelanong e e tshwanang mo potsong e nngwe le e nngwe e ntšhwa e e arabiwang.



Setshwantsho 93 Tsheko ya Go Ranola Tshedimosetso

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

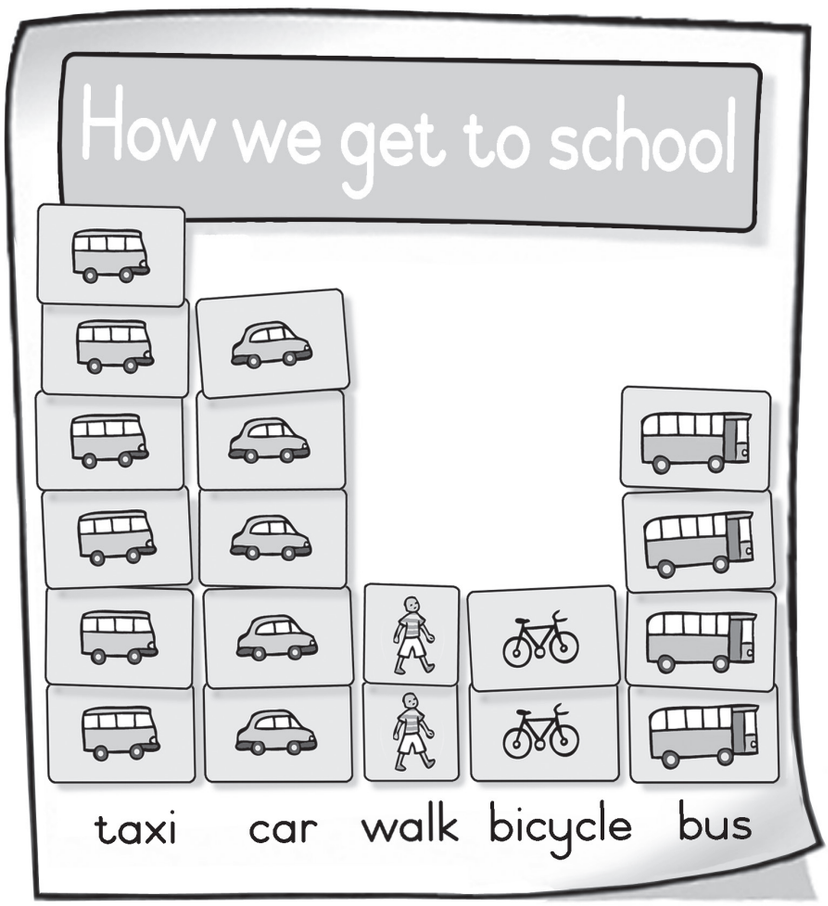


Figure 94 A pictograph

1. **Botsa potso:** Barutwana ba swetsa gore ba batla go batlisisa ka ga eng, sk. 'Ke ipotsa gore ke bana ba le bakae ba ba tlang sekolong ka bese le gore ke ba bakae ba ba tlang ka koloi?' Tlhale e e tshwereng dinewa mmogo ke lebaka la go kokoanya tshedimosetso e e rileng. Seno se kaya gore dinewa tse di kokoantsweng kgotsa ditlhopha tse di dirilweng ka go rulaganya di tshwanetse go thusa go araba potso e barutwana ba sweditseng go e batlisisa.
2. **Kokoanya dinewa:** Barutwana ba swetsa gore ba tlaa kokoanya jang dinewa ba ikaegile ka potso kgotsa bothata, sk. ka go botsa barutwana bangwe gore ba tla ka eng sekolong le go rala ditshwantsho.
3. **Rulaganya dinewa:** Barutwana ba rulaganya dinewa le go di baya ka ditlhopha go latela ponagalo. Gore ba kgone go araba dipotso le go swetsa gore ba tlhagisa jang dinewa tse ba di kokoantseng, ditshwetso tsa gore dilo di ka rulaganngwa jang di tshwanetse tsa tsewa.
4. **Go tlhagisa dinewa:** Barutwana ba tlhotlhomisa ditsela tse di farologaneng tsa go bontsha kgotsa go supa tshedimosetso e ba e kokoantseng, sk. ka go baya dilo tse di bonalang mo mmetsheng kgotsa go dira **dikerafotshwantsho**.
5. **Sekaseka dinewa:** Barutwana ba tlhalosa le go bapisa dinewa tse di tlhagisitsweng, sk. ke mokgwa ofe o go iwang sekolong ka ona ka bontsi kgotsa bonnye.

LENAANEFOKO

kerafotshwantsho
tsela ya go tlhagisa dinewa ka go dirisa ditshwantsho

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. **Bega ka dinewa:** Barutwana ba araba potso e e boditsweng pele, ‘Ke ipotsa gore ke barutwana ba le kae ba tlang ka bese le gore ke ba le kae ba tlang ka koloi?’ Ba kgona go bona bonolo fela gore barutwana ba le bane ba tla sekolong ka bese le gore ba le batlhano ba tla ka koloi. Gape ba ka bapisa tshedimosetso e nngwe jaaka gore ke barutwana ba le kae ba ba tlang sekolong ka mekgwa e mengwe le gore ke mofuta ofe wa sepalangwa o o dirisiwang go gaisa kgotsa go le gonnye.

Dipotso tse o ka di botsang mo Go Ranola Tshedimosetso

- Ke setlhopha sefe se se nang le bontsi/bonnye? A o ka bolela ntle le go bala?
- Ke setlhopha sefe se se nang le go le gontsi/mmalwanyana?
- O akanya gore karabo e tlaa nnang?
- Re ka batlisisa jang?
- O kopantse jang dilo tseno?
- A o ka rulaganya tseno ka tsela e sele?
- A tseno ke tsa fano?
- A dilamune kgotsa dipanana ke maungo a a tlwaelegileng thata?
- Ke malatsi a le kae a go neng go le letsatsi, diphefo, pula, …?
- Go ka diragalang fa …?

Tlotlofoko ya Go Ranola Tshedimosetso

- nyalanya, rulaganya, bapisa
- tshwana, farologaneng, ya ga, ga se ya ga ope
- ntsi go, mmalwanyana go, tshwana le
- ka gale, nakonngwe, ga go ka ke
- mothalo, kholomo
- ka gongwe, kgonega, netefaletsa

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

Lenaanefoko

amana gore dilo le dikakanyo di gokagana jang

arologantsha tsamao ya go baya dilo tse di tshwanang ka ditlhopha ka tsela e e lolameng, sk. go aroganya diaparo tsa mariga le tsa selemo

boakaretsi tiragatso ya go netefatsa gore bana botlhe, go sa kgathalesege dipharologano tsa bona, ba akarediwa mo ditirwaneng tsotlhe tsa phaposiborutelo

boima sengwe se boima go le kae

bonela pele go bua kgotsa go fopholetsa gore go tlaa diragalang mo isagong

botsereganyi tirwana ya motlhakanelwa moo motho yo o itseng go le gontsi kgotsa a na le dikgono tse di kwa godimo o kaelang ba bangwe go ithuta sengwe se sešwa

dielemente dilo metsamao kgotsa ditiragalo mo pateroneng

dirisana tlhaeletsana le batho ba bangwe; go dira ditirwana le batho ba bangwe

ditiragatso ditsela tse di farologaneng tsa go dirisa megopolo le dikgono, sk. go tlhola poelo ya gago ya madi mo lebenkeleng, go bala madi a go palama thekesi, kgotsa go aroganya pakete ya matonkomane magareng ga ditsala tse tharo

ditlhakorepedi (2-D) sebopego se na le matlhakore a mabedi: boleele le boalo (bophara)

ditlhakoretharo (3-D) sebopego se na le matlhakore a mararo: boleele, boalo (bophara) le bogodimo

go bala ka tatelano go balela kwa godimo, o bala dinomore ka thulaganyo e e nepagetseng (gape e itsege jaaka go balela kwa godimo le palelogodimo)

go balela diphitlhelelo go bala dilo go batla gore 'di kae' (gape e itsege jaaka go balela dipoelo)

go balela dipoelo go bala dilo go batla gore 'di kae' (gape e itsege jaaka go balela diphitlhelelo)

go balela kwa godimo go balela kwa godimo, o bala dinomore ka thulaganyo e e nepagetseng (gape e itsege jaaka go bala ka tatelano le palelogodimo)

go bapisa go lebelela dintlhatshwano kgotsa dipharologantsho magareng ga dilo tse pedi kgotsa go feta, sk. 'tseno tsotlhe ke diphologolo mme e nngwe e tala fa e nngwe e le khibidu'. Go bapisa ke go batlisisa kamano magareng ga dilo o ikaegile ka diponagalo tse di rileng. Kgono eno e isa kwa bokgoning jwa go arologanya dilo.

go baya mabaka kakanyo e e latelang mogopolo kgotsa polelo

go latedisana go tlhomaganya dilo kgotsa ditiragalo tse pedi kana go feta ka tatelano, sk. meetlo ya letsatsi le letsatsi ya phaposiborutelo, meetlo ya mo mosong ya barutwana ('fa ke sena go tsoga ke tswa mo bolaong, ke tlhapa sefatlhego, ke ja sefitlholo ...') kgotsa ditiragalo mo kgannyeng

go nyalanya go supa dintlhatshwano mo dilong tse pedi kgotsa go feta, sk. dilo tsotlhe tse di serolwana. Go nyalanya ke kgono ya botlhokwa ya go ithuta tsamaelano ya bongwe ka bongwe.

go rulaganya go batla dilo tse di tshwanang, kgotsa di tshwana mme o di baya ka dilthopha go ya ka diponagalo tse di rileng. La ntlha di rulaganye ka ponagalo e le nngwe, jaaka mmala, sk. 'dibopego tsotlhe tse ditala'. Jaanong di rulaganye ka diponagalo tse pedi jaaka mmala le bogolo, sk. 'dibopego tsotlhe tse dinnye di le ditala'.

go sa bonale kakanyo, mogopolo kgotsa maikutlo

go sekena bokgoni jwa go nna le tlhaloganyo ya go lemoga palogotlhe ya dilo mo go tse di kokoantsweng ntle le go di bala

jeometeri karolo ya dipalo e e dirang ka dipharologantsho, tekanyo le dikamano tsa dintlha, mela le dikhutlo tsa dibopego mo sebakeng

kakanyo seabe sa bokgakala kgotsa boteng mo tlhagelelong ya dilo

kelotlhoko go dirisa ditemosi tsa rona go batlisisa ka ga dilo, ditiragalo le maitshwaro. Re tshwanetse go ela tlhoko go kokoanya tshedimosetso ka ga lefatshe, sk. go lebelela le go reetsa sentle se se diragalang mo tikologong ya rona.

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

kerafotshwantsho tsela ya go tlhagisa dinewa ka go dirisa ditshwantsho

kitso ya pele se barutwana ba tlang ba se itse le se ba kgonang go se dira

matshwao dilo tse di supang kgotsa emela sengwe, jaaka fa e le letshwaopalo, letshwaokgwebo kgotsa letshwaotsela

methalethale mefuta ya batho ka dipharologano tsa bona, sekao, itshupo, botho, bokgoni, tse ba di ratang le lemorago la bona

mogopolo mogopolo kgotsa kakanyo. Ka mantswe a mangwe ga e ka ke ya angwa. Megopolo ya dipalo e akaretsa dipalo, go bala, sebaka, go tlhakanya le go ntsha.

molawana molawana wa kakaretso o o amogetsweng jaaka boammaaruri

mothamo mothamo tlalo kgotsa bokaakang jo bogolo oo sengwe (jaaka kgamelo kgotsa lebokoso, kgotsa setediamo) se ka o tsholang bonnye

palelogodimo go balela kwa godimo, o bala dinomore ka thulaganyo e e nepagetseng (gape e itsege jaaka go balela kwa godimo le go bala ka tatelano)

paterone paterone e e tlwaelegileng ya dilo, metsamao le ditiragalo tse di ipoeletsang ka mokgwa o o bonelwang pele

pharologantsho diponagalo tsa sebopego sa 2-D kgotsa 3-D, sk. boleele, bophara, bogodimo, matlhakore (difatla), mathoko, dikhutlo

ponagalo ponagalo kgotsa popego ya sengwe, sekao, mmala kgotsa sebopego

tatelano thulaganyo e e rileng, moo dilo, metsamao kgotsa ditiragalo di latelanang ka yona

tekano fa sebopego kgotsa popego se ka arolwa ka bogare ka diripa tse pedi tse di tshwanang

tekanyo 'ke bogolo jo bo kana kang' jwa sengwe, sk. bogodimo, boleele, boima, mothamo

temosi ya bokgoni jwa go tlhaloganya ka go dirisa ditemosi tsa gago go kgobokanya tshedimosetso ka ga tikologo ya gago, sekao: go bona, go utlwa, go kgoma, go nkgelela le go latswa

tlhatlhobo ya letsatsi le letsatsi tlhatlhobo e e tlamelang ka tshedimosetso fa thutego e ntse e diragala mme e lekanya tswelelopele ya barutwana

tlwaetso dilo di beilwe jang kgatlhanong le tse dingwe

tshwana ka bokhutshwane, ka nepo

tshwantsha go dirisa dilo, matshwao kgotsa ditiragatso go emela kakanyo kgotsa kgopolo

tswelelopele ya kgolo tatelano eo dikgono le megopolo di agelelang go tsona ka teng

volumo bokaakang jwa sengwe kgotsa sebaka se se tswalwang ke diteng

yuniti e e sa tlhomamang yuniti ya tekanyo e e dirisang dilo tse di tshwanang le setlhako, setshwarapampiri kgotsa seraro/khube; go ka dirisiwa gape dilo tse di sa tlhomamang jaaka boleele jwa letsogo, lenao kgotsa mmele

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