INkqubo yeMathematika yokuPhucula yeBanga R

Grade R Mathematics Improvement Programme

IsiKhokelo seeKhonsepthi
Concept Guide

IsiXhosa | English

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

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

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

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

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

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

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IProjekthi yeBanga R yokuPhucula yeMathematika noLwimi lilinge le**Sebe leMfundo laseGauteng (Gauteng Department of Education)** kunye neqabane layo eliphambili, i**Gauteng Education Development Trust**.

Ukwenziwa nokuveliswa kwezixhobo zoqeqesho nezegumbi lokufundela kwenziwe kwayimpumelelo ngezibele zenkxasomali ye**United States Agency for International Development** kwakunye ne**Zenex Foundation**.

IProjekthi yeBanga R yokuPhucula yeMathematika noLwimi ilawulwa yi**JET Education Services** ne**Schools Development Unit** yase**UCT** kunye no**Wordworks** njengamaqabane ezobugcisa.

I**Schools Development Unit** (SDU) kwi**Yunivesithi yaseKapa** (UCT) liqabane lezobugcisa kwimathematika kwiProjekthi yeBanga R yokuPhucula yeMathematika noLwimi. ISDU yiyunithi ngaphakathi kwiSchool of Education kwiYunivesithi yaseKapa egxile kuphuhliso lobungcali bootitshala kwiMathematika, izifundo zeNzululwazi, iLitherasi/uLwimi kunye neZakhono zoBomi ukusuka kwiBanga R ukuya kwiBanga le-12. ISDU inikezela ngeziqinisekiso zootitshala kunye nezifundo ezifutshane ezivunyiweyo zeUCT, umsebenzi osekwe esikolweni, uphuhliso lwezixhobo kunye nophando lokuxhasa ukufundisa nokufunda kuzo zonke iimeko eMzantsi Afrika.

Olu hlelo lwezixhobo zolwimi luvele ngenxa yanxaxheba yabalingane bethu bakwaWordworks kwaye luphuculwe ngokunxulunyaniswa nezixhobo zeNkqubo yokuPhucula uLwimi. Luphuculwe ngakumbi ngumsebenzi wamagosa eSebe leMfundo laseGauteng ajongene ne-Early Childhood Development kunye neCandelo leKharityhulam yesiGaba esisisiSeko kwiZithili nakwiPhondo. La magosa abe negalelo elingathethekiyo ekuvelisweni komxholo wezi zixhobo baze baziqwalasela ngononophelo ukuqinisekisa ukuba ezi zixhobo zihambelana kunye nemigaqo, indlela ekwenziwa ngayo kunye neenqobo ezisemgangathweni zephondo.

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- Iqela lababhali be*R-Maths*: Amagosa oPhuhliso lwaBantwana aBasaqalayo eWCED, uCally Kuhne, uKaren Kaimowitz, uBev Da Costa, uMeryl Glaser, uSue Bailie, uSue Connolly, uSue Heese.

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Inguqulelo yesiXhosa: Schools Development Unit (Tholisa Matheza kunye noNomfundo Mfobo)
Ukuhlela kunye nokulungisa iziphene ngesiXhosa: Pumeza Ngobozana
Ukuhlela kunye nokulungisa iziphene ngesiNgesi: Ilse von Zeuner, Kathleen Sutton
Imizobo: Jiggs Snaddon-Wood
Ukucwangcisa: Jenny Wheeldon
Uyilo lwangaphakathi: Magenta Media
Uyilo lweqweqwe: Jacqui Botha

Contents

Isiqulatho

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

Ingabula zigcawu evela kwiNtloko yeSebe

Titshala/Msebenzi Othandekayo

Wamkelekile kuqeqesho lootitshala/abasebenzi beBanga R. ISebe leMfundo laseGauteng (Gauteng Department of Education (GDE)) libeke phambili uPhuhliso lwaBantwana abaNcinci njenge njongo yesiCwangciso sayo soku-1. Oku kukuqinisekisa ukuba sinako ukubeka isiseko esiluqilima kunye nenguqu elula yabantwana ukuya kwiBanga loku-1.

IProjekthi yeBanga R yokuPhucula yeMathematika noLwimi iphuhliswe ukuze inike *inkxaso* edingeka kakhulu eziklasini kootitshala beBanga R eGauteng. Imalunga nendlela yokusebenza eklasini kwaye iqulathe iindlela zobuchule ezinika umdla kunye neendlela ezifanelekileyo zokufundisa nokufunda kwiBanga R. Oku kukuphendula kuphando olunengxelo ethi malunga nama65% yabantwana baseMzantsi Afrika abanazo izakhono ezifanelekileyo ezinokubanceda kwiLitheresi neNumeresi xa bengena kwiBanga loku-1. Le projekthi yenzelwe ukuxhasa ootitshala/abasebenzi beBanga R ukuze bajongane nalo mngeni.

Okulindelewe liSebe kukuba ube kanti ukulungele ukufunda nokuba ngutitshala/umsebenzi weBanga R oxhobe nangakumbi. Ukuzibophelela kwakho kwinkqubo yolu qeqesho kwaye emva koko uphumeze *izifundo* ozifundileyo eklasini *yakho*, kuya kuba negalelo ukuphucula ukuba umfundi weBanga R alungele ngokufanelekileyo iBanga loku-1.

Siyathemba ukuba olu ngenelelo luza kunceda ukunyusa amandla akho, iindlela ezintsha zokwenza izinto kunye nobuchule njengoko ubeka isiseko sokufunda kubantwana bethu. Le projekthi ibingenakukwazi ukuphumelela ngaphandle kwenkxaso yamahlakane ethu bethu. IGDE inombulelo ongazenzisiyo kwiGEDT, iZenex Foundation neUSAID ngegalelo labo kweli phulo.

Ndiyathemba uza kufunda izinto ezininzi kule nkqubo yoqeqesho kwaye uphucule amava okufunda abantwana abancinci abakunonophelo lwakho.

Ozithobileyo

Mnu Edward Mosuwe

INtloko yeSebe: iSebe leMfundo eGauteng

3 KweyeSilimela 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.

ICANDELO 1

INkqubo yeMathematika yokuPhucula yeBanga R (u*Grade R Maths*)

Intshayelelo

U*Grade R Maths* yinkqubo yabaqalayo yeBanga R elungelelaniswe neyandisa umxholo weMathematika yeBanga R kuCAPS. U*Grade R Maths*:

- wenzelwe ukunika isikhokelo ekufundiseni nasekufundeni iMathematika kwiBanga R
- usekelwe kwiseti yemigaqo yokufundisa ekhuthaza imfundiso ephumelelayo
- ucacisa iikhonsepthi ezibalulekileyo kuphuhliso lwemathematika kubantwana abancinci
- wenza ulandelelwano lomxholo wemathematika weBanga R kwaye unika nezimvo ezenziwayo eklasini
- unika ootitshala isikhokelo esicacileyo esixhasa isicwangciso sabo sokufundisa.

Igama elithi 'mathematika' lisetyenziswe ngeendlela ezininzi kule ncwadi. Nazi iindlela elisetyenziswe ngazo nengcaciso yegama ngalinye:

- **imathematika** ngumzimba wolwazi obizwa ngokuba yimathematika equka iikhonsepthi, izakhono kunye nomsebenzi
- **IMathematika yeBanga R** yikharityhulam kwiNkcazelo yePolisi yeKharityhulam nokuHlola (CAPS)
- U***Grade R Maths*** ligama lale nkqubo yeMathematika yeBanga R
- i**Mathematika kwiBanga R** luhlobo lokufunda imathematika kwiBanga R.

Kwesi sikhokelo, igama elithi 'abantwana' lisetyenziswe ukuthetha ngabantwana phambi kokuba bafunde iBanga R. Igama 'um/abafundi' lisetyenziswa xa kuthethwa ngabantwana abafunda kwiBanga R.

Iimpawu *zesiKhokelo seeKhonsepthi* ziquka:

- ulwazi lokufundisa nokufunda imathematika
- **'Ukuziqhelisa'** iibhokisi ezinika imizekelo yokuba imigaqo kunye neembono kule ncwadi zingasetyenziswa kunye okanye ngabantwana
- Iibhokisi **zoluhlu lweenkcazelo** ezinika intsingiselo yamagama asenokuba matsha okanye anzima ukuwaqonda
- uluhlu lweenkcazelo luluhlu lwamagama onke amatsha asetyenziswe kule ncwadi.

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.

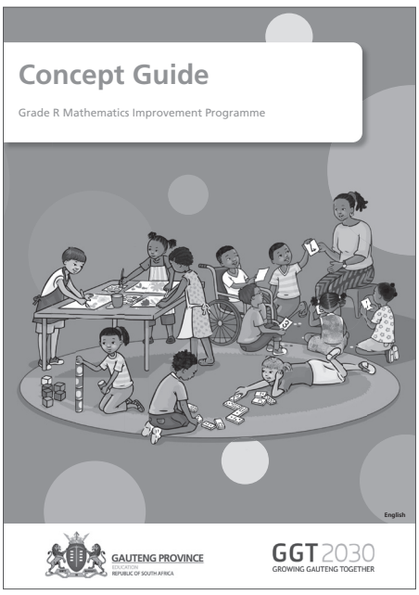


Figure 1 The *Concept Guide*

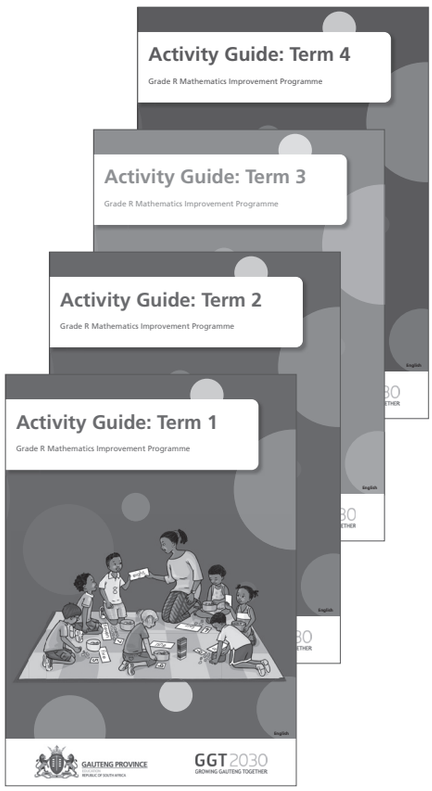


Figure 2 *Activity Guides* Term 1–4

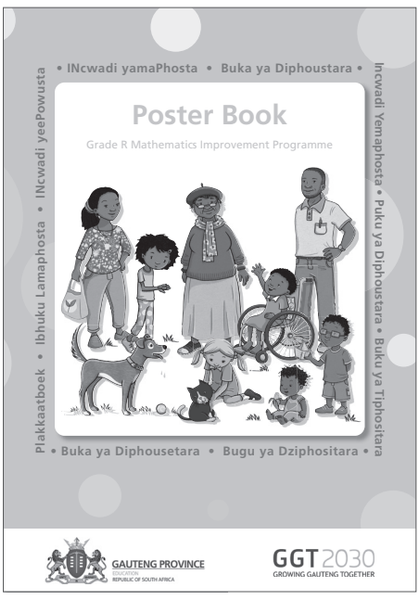


Figure 3 The *Poster Book*

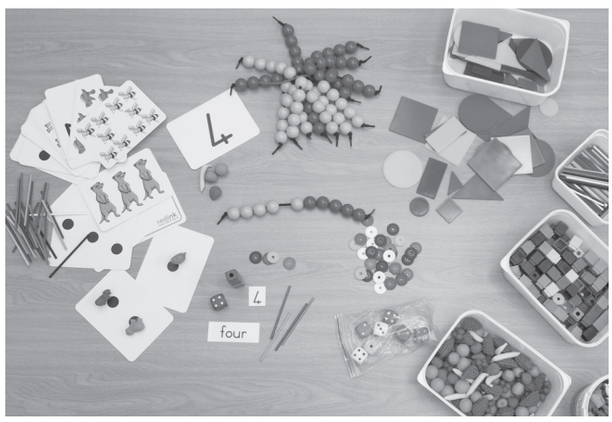


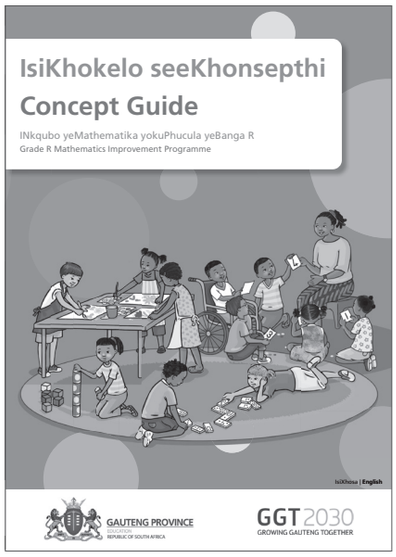
Figure 4 *Resource Kit*

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

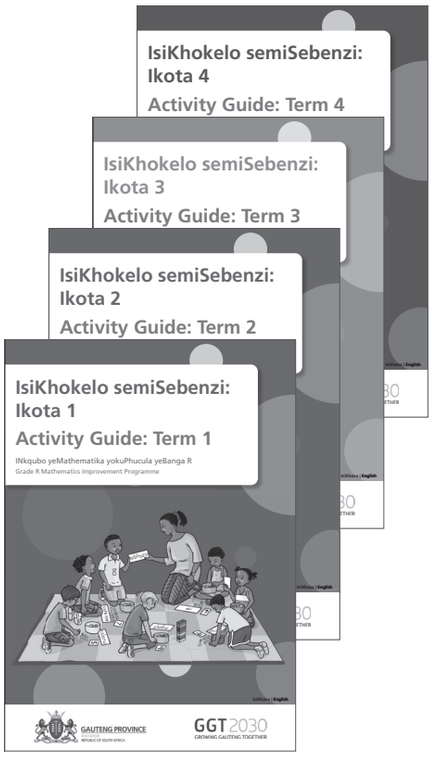
U*Grade R Maths*

Kukho iikhomponenti ezine ku*Grade R Maths:*

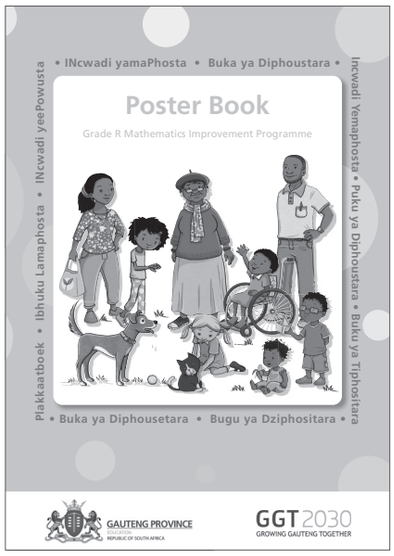
- *IsiKhokelo seeKhonsepthi*
- *IziKhokelo zemiSebenzi* ezine – esinye kwikota nganye yesikolo – ezibonisa ootitshala beBanga R iingcebiso abanokuzisebenzisa ngeveki ukufundisa nokufunda imathematika
- *INcwadi yeePowusta* eneepowusta ezilishumi elinanye
- *IKiti yeziXhobo* yeklasi enezixhobo zemathematika esetyenziswa ekufundeni nasekufundiseni umntwana ngamnye okanye iqela elincinci.



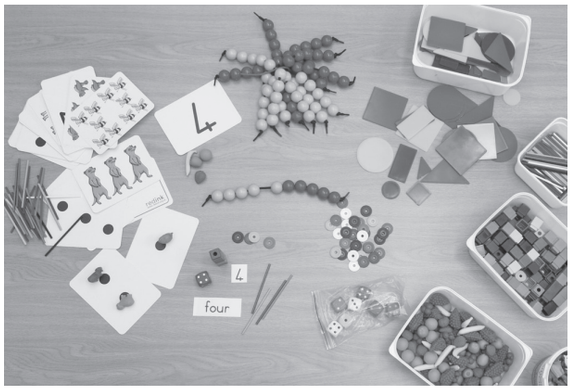
Umfanekiso 1
IsiKhokelo seeKhonsepthi



Umfanekiso 2 *IziKhokelo zemiSebenzi* Ikota 1– 4



Umfanekiso 3 *INcwadi yeePowusta*



Umfanekiso 4 *IKiti yeziXhobo*

Ungafumana ulwazi oluphangaleleyo ngekhomponenti nganye ka*Grade R Maths* kwesi *siKhokelo seeKhonsepthi*.

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

Imigaqo ekhokela ukufundisa imathematika ‘izibalo’ kwiBanga R

U*Grade R Maths* ukhuthaza indlela ethile enika inkuthazo nomdla ekufundiseni nasekufundeni kubafundi. Abafundi bazakukhulisa ulwazi nezakhono abaza kwakhela phezu kwazo kumabanga azayo. Uphandonzulu ngezemfundo eziklasini luphawula iseti **yemigaqo** yokufundisa, eyongezelela/ephuhlisa kwimfundiso eyimpumelelo. Inkqubo ka*Grade R Maths* isekelwe kwesibhozo yale miqaqo esisiseko.

ULUHLU LWEENKCAZELO

umgaqo
ziingcebiso, umthetho jikelele ovunyiweyo ukuba uyinyani

1. **Umgaqo womxholo.** Ukufunda kwenzeka kwiimeko ezinentsingiselo nezifanelekileyo.

8. **Umgaqo wokuziqhelisa.** Ukufunda kuqukunjelwa ngokuziqhelisa kwizakhono ezitsha nolwazi.

2. **Umgaqo womsebenzi.** Abafundi kufuneka bathathe inxaxheba ngqo kwinkqubo yokufundiswa kwabo.

7. **Umgaqo woquko.** Ukufunda kwenzeka kwimeko apho wonke umntu amkelekileyo, equkiwe, ephethwe kakuhle, enikwa imbeko kwaye ethathe inxaxheba.

IMIGAQO ESIBHOZO KA*GRADE R MATHS*

3. **Umgaqo wokudlala.** Abantwana bafunda ngokugqibelela xa bezidlalela naxa besenza imisebenzi eyimidlalo ekhokelwayo.

6. **Umgaqo wokukhokela.** Ukufunda kwenzeka xa ootitshala bekhokela abafundi ekuphuhliseni ulwazi olutsha.

5. **Umgaqo wentsebenziswano.** Ukufunda kwenzeka xa kukho amathuba onxibelelwano nokwabelana ngamava.

4. **Umgaqo wenqanaba.** Abafundi badlula kumanqanaba ohlukeneyo okuqonda nophuhliso.

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.

Nangona le migaqo yokufundisa esibhozo idweliswe ngokwahlukeneyo, yonke inxulumene.

Okulandelayo kwesi *siKhokelo seeKhonsepthi* kukucaciswa kwale migaqo isibhozo u*Grade R Maths* asekelelwe kuyo. Umgaqo ngamnye une:

- ngcaciso
- bhokisi ethi 'Ukuziqhelisa'
- ngcaciso engaphezulu ngomgaqo lowo.

1. Umgaqo womxholo

Ingcaciso

Ukufunda kwenzeka kwimeko (okanye umxholo) enentsingiselo kumfundi. Amaxesha amaninzi, ezona ngxaki zemathematika ezizizo ziquka izimvo zemathematika ezisuka kwiimeko ezenzekayo ebomini. Abafundi bafumana kulula ukuphonononga izisombululo zeengxaki abakwaziyo ukuzayamanisa nazo ngenxa yamava obomi babo.

Ukuziqhelisa ...

Kukho amathuba okufunda imathematika kuyo yonke imisebenzi yemihla ngemihla yasekhaya neyasesikolweni. Ingxaki yootitshala nabazali kukuhlala besoloko bewazi la mathuba nokuba bawasebenzise ekuphuhliseni oko abantwana sele bekwazi.

Okunye ngomgaqo womxholo

Imathematika yabaqalayo ekhayeni

Abantwana abancinci amava abawafumana ekhayeni nasekudlaleni phandle abeka isiseko esisiso ekuqondeni i**ikhonsepthi** zemathematika ezibalulekileyo.

Iintsana, abantwana ababhadazayo nabantwana abancinci basebenzisa izivo zabo ukufunda ngelizwe elibangqongileyo. Babonisa umdla kwiimilo ezilula, ukwenza iipatheni ezilula nokufunda ukubala phambi kokuba baye esikolweni. Bafunda ngelizwe ngelixa bathethayo, batyayo naxa bedlala baqonda ezi khonsepthi zemathematika ngaxesha nye. Umzekelo:

- Xa bezama ukufaka izinto ezinkulu emilonyeni yabo emincinci, bakhulisa ulwazi lokuqonda ubukhulu bento.
- Xa besebenzisa iibhokisi neeroli zamaphepha angasese ukwakha iimoto ezikwiimbono, bakhulisa ulwazi lokuqonda iimilo.
- Xa bezama ukunyusa iibhokisi ezinzima nezinkulu, baqala ukukhulisa ulwazi lokuqonda ubunzima.
- Xa bekwazi ukubona ukufana nokwahluka kwezinto eziqokelelweyo ezincinci abazitshatisayo, abazihlelayo nabazithelekisayo.

Abantwana abancinci baqala ukuba nolwazi ngeekhonsepthi zemathematika phambi kokuba bafundiswe imathematika esikolweni.

ULULHU LWEENKCAZELO

ikhonsepthi
ngumbono oqikelelwayo. Ngamanye amagama, awubambeki okanye uphathwe umz. ukuvuya okanye uthando. Iikhonsepthi zemathematika ziquka inani, ukubala, isithuba, ukuthabatha nokudibanisa.

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

Imisebenzi yemihla ngemihla yabantwana emakhaya izele ngamathuba okufunda imathematika yabaqalayo. Umzekelo:

- ngelixa lemisebenzi yesiqhelo umz. ixesha lokutya, ukuhlamba, ukunxiba nokupakisha izinto
- xa besebenzisa izinto umz. bebeka iziciko kwizitya zeplastiki nokusika besebenzisa izikere
- xa bedlala umz. xa bebolekana ngezinto, besenza ngathi bayapheka okanye beqhuba iteksi
- xa bezoba befaka nepeyinti
- xa belinganisa abantu abadala bebala.

Le misebenzi ikhulisa ukuzithemba komntwana. Ngaxesha nye, bakhulisa ulwazi lwabo nokuqonda ilizwe elibangqongileyo.

Umfanekiso 6 Ukusebenzisa imisebenzi yemihla ngemihla ukuphononongа iikhonsepthi zemathematika

Ukuqonda kwabantwana abancinci imathematika kuphuhla ngokuhamba kwexesha.

- Bafunda ngokuba amanani anexabiso okanye ubungakakani obunxulumeneyo kuwo okungatshintshiyo, umz. umntwana onemimyaka emithathu xa ephakamisa iminwe emithathu ukubonisa ubungakanani buka ‘ntathu’.
- Bangaphinda uluhlu lwamanani, umz. ‘nye, mbini, ntathu, ntandathu, shumi’. Xa besenza oku balinganisa abantu abadala ngokusebenzisa amagama okubala ngaphandle kokuba bazazi ukuba bathetha ukuthini na.

Xa abantwana bezidlalela okanye bedlala nabanye abantwana, naxa **benxibelelana** nabantu abadala ababangqongileyo, baqalisa ukukhulisa izimvo ngeekhonsepthi zenani, imilo, isithuba nomlinganiselo.

Iikhonsepthi ezifundwa ngabantwana emakhayeni kwimisebenzi yabo yemihla ngemihla, ngamanye amaxesha zibizwa ngokuba ‘lulwazi lwemihla ngemihla’. Umzekelo, xa abantwana bebeka izitya ezaneleyo zabantu kuza kutyiwa isidlo, emva koko babeke icephe elinye kwisitya ngasinye. Xa besenza oku, bafunda ngokutshatisa enye nenye.

ULUHLU LWEENKCAZELO

unxibelelwano
nxibelelana nabanye abantu; yenza izinto nabanye abantu

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

Imathematika kumxholo wesikolo

Abantu abaninzi bacinga ukuba imathematika ngamanani nokubala kuphela kodwa oku yinxenye nje enye yemathematika ebizwa ngokuba yiarithmetiki. Imathematika iquka iikhonsepthi ezininzi ezahlukeneyo kunye nezakhono. Ikwaquka iindlela ezahlukeneyo zokusebenzisa ezi khonsepthi nezakhono. Oku ke kubizwa ngokuba '**luphuhliso nokusetyenziswa**'. Ngoko ke, xa sithetha ngemathematika sithetha ngeekhonsepthi, izakhono kunye nendlela yokusetyenziswa kwayo.

Abantwana basebenzisa iikhonsepthi zemathematika yonke imihla nokuba abacingi ngazo ukuba benza imathematika. Basebenzisa iikhonsepthi zemathematika xa begcwalisa ikomityi ngaphandle kokuchitha, besazi ukuba sesiphi isikhongozeli abaza kusisebenzisa ukufaka zonke iibhloko, ukuyokuthenga okanye batsho uba zingaphi izinto abanazo.

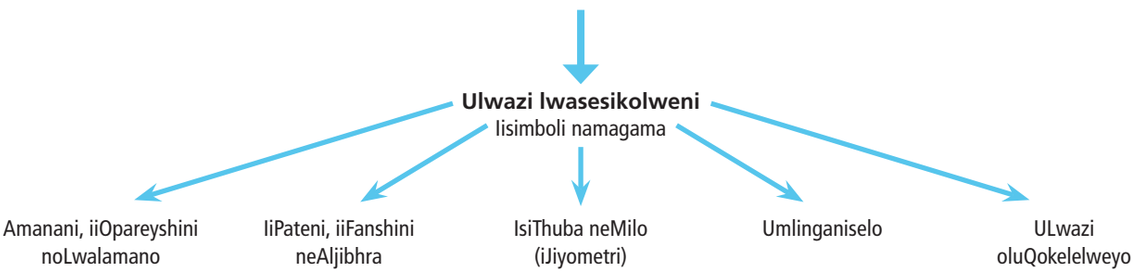
ULUHLU LWEENKCAZELO

uphuhliso nokusetyenziswa
ziindlela ezohlukeneyo zokusebenzisa iikhonsepthi zemathematika, umz. ukubala imali yokukhwela iteksi okanye ukwahlulela abahlobo abathathu ipakethi yamandongomane

Umfanekiso 7 Sonke sisebenzisa iikhonsepthi zemathematika imihla ngemihla – ukukhetha ibhokisi enobukhulu obufanelekileyo.

Esikolweni, abantwana bokha phezu kolu lwazi xa, umzekelo, behlela izinto ngokwamaqela baze bathelekise inani lezinto kwiqela ngalinye. Emva koko bafunda ukubala besebenzisa ulandelelwano oluchanekileyo lwamanani kwaye basebenzise ukubala enye nenye ukufumana inani lezinto lilonke kwingqokelela. Le nto ibizwa ngokuba 'lulwazi lwasesikolweni'.

Ulwazi lwemihla ngemihla
ukuthelekisa, ukuhlela, ukutshatisa, ukubiza amagama amanani, ukufunda ngongaphezulu/ngaphantsi, inkulu/incinci, ilula/inzima



Umfanekiso 8 Unxulumano phakathi kolwazi lwemihla ngemihla nolwazi lwasesikolweni

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.

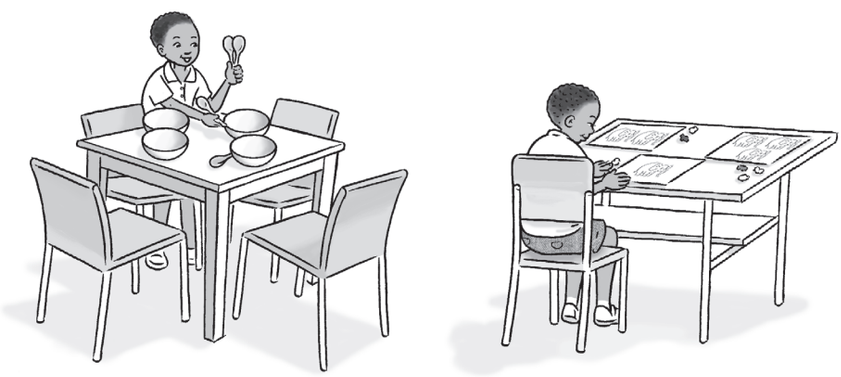


Figure 9 Counting and one-to-one matching at home and at school

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

Xa abantwana befika kwiBanga R, beza namava abo, ukuqonda kunye nezimvo zabo ngelizwe. Olu lulwazi lwabo lwemihla ngemihla. Ulwazi lwabantwana lwemihla ngemihla aluyi kufana kuba oku kuxhomekeke kusapho abaphuma kulo, kuluntu kunye neenkcubeko zabo. Ulwazi lwemihla ngemihla ngamanye amaxesha lubizwa ngokuba l**ulwazi lwangaphambili** kwaye ootitshala basebenzisa lona ukwakha koko abafundi sele bekwazi okanye benokukwenza.

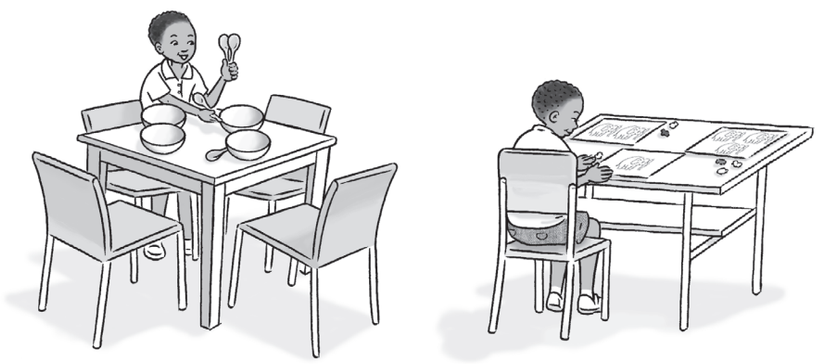
ULULHU LWEENKCAZELO

ulwazi lwangaphambili
ulwazi abafundi abasele benalo kunye nezinto asele bekwazi ukuzenza

KwiBanga R, kufuneka abafundi babenethuba lokuphicotha, ukuphanda kancinane kwaye baqhelaniswe namava amatsha. Kananjalo kufuneka bakhuthazwe ukuba bathethe nootitshala babo nabanye abafundi malunga nezinto abazenzayo nabazicingayo. Abafundi bafuna uhlobo olulungileyo lokufundiswa ukubanceda:

- bacinge kwaye bathethe ngamava abo besebenzisa ulwimi lwemathematika
- ukwakha ulwazi olutsha lwemathematika
- ukuqonda ulwazi olunzulu lwemathematika
- ukuphuhlisa indlela ababona ngayo imathematika.

Kufuneka bathathe inxaxheba kwimisebenzi yasekhaya nasesikolweni ebavumela ukuba baphonononge iikhonsepthi zemathematika, babone imathematika ngendlela eyonwabisayo.



Umfanekiso 9 Ukubala kunye nokutshatisa izinto enye-nenye ekhayeni nasesikolweni

Ukudala indawo yokufundela imathematika

Ootitshala kufuneka benze imeko eklasini apho abafundi:

- baziva bekhuselekile
- bezithemba ngokwaneleyo ukuze bathethe
- bathathe inxaxheba kuyo yonke imisebenzi.

Imeko yendawo yokufunda imathematika kufuneka iquke:

- izixhobo zokusebenza (ezifana nemidlalo, izinto zokwakha kunye neephazili) ezibekwe ngendlela eyiyo ukuze abafundi babone ukuba yintoni ekhoyo abaza kukhetha oko bafuna ukukusebenzisa
- amathuba okuhlola nokuphanda
- amathuba abafundi besebenzisa izinto ukusombulula iingxaki ze babhale izisombululo zabo
- amathuba abafundi basebenzise ulwimi lwemathematika, olunjengo ‘ngaphezulu’, ‘inkulu kune’, ‘kwikona’ namanani

- 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.

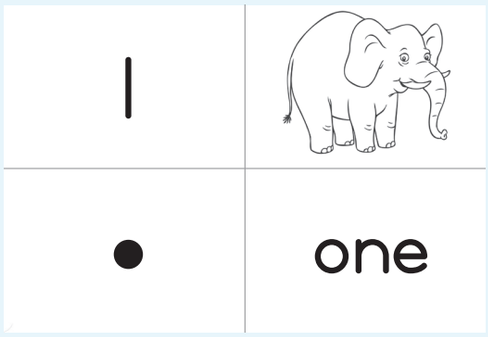


Figure 10 Number frieze

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.

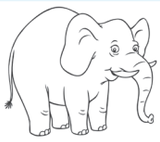
sorting
finding things that are the same, or alike, and grouping them by specific features. First sort by one feature, such as colour, e.g. 'all the green shapes'. Then sort by two features, such as colour and size, e.g. 'all the small, green shapes'.

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

- imisebenzi equka **ukubukela**, **ukutshatisa**, **ukuthelekisa**, **ukuhlela** no**kulandelelanisa**.

Ukuziqhelisa ...

- Lungisa indawo ibe yenobutyebi bezinto zemathematika eklasini yakho. Sebenzisa itafile uyibeke ecaleni kodonga ukuze ibeneeleyibhile, imifanekiso nezinto ezinokubekwa kuxoxwe ngazo.
- Lungisa itshati yemozulu, ikhalenda, umgca-manani (ucingo lokwaneka amanani) kunye nefrizi yamanani kule ndawo kwaye uzisebenzise kwingxoxo yemihla ngemihla.
- Beka nemisebenzi yabafundi kule ndawo.
- Khuthaza abafundi ukuba beze nezinto emakhaya ekuza kuxoxwa ngazo. Zongeze ezi zinto kwitafile ekubekwa kuyo uze unike abafundi abaze nezinto ithuba lokuthetha ngazo.

I	
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Umfanekiso 10 Umfanekiso wefrizi yamanani

Umfanekiso 11 Indawo yemathematika

2. Umgaqo womsebenzi

Inkcazelo

Umgaqo womsebenzi uthetha ukufunda ukwenza izinto ngokwakho. Abafundi kufuneka bathathe inxaxheba ekufundisweni kwabo. Ukufunda imathematika kwiBanga R kufuneka kube nemisebenzi eyenziwayo eyonwabisayo, ebandakanya izinto zemihla ngemihla namava anentsingiselo. Naphi na apho kunokwenzeka imisebenzi kufuneka ibonelele abafundi ngamathuba okusebenzisa imizimba yabo yonke kunye nezivo zabo, ingakumbi ukubona, ukuva nokubamba.

ULULHU LWEENKCAZELO

ukubukela
ukusebenzisa izivo ukufumanisa ngezinto, iziganeko kunye nokuziphatha. Kufuneka sibukele ukuqokelela ulwazi malunga nelizwe umz. ukujonga nokuphulaphula ngenyameko okwenzeka jikelele kuwe.

ukutshatisa
ukuchonga izinto ezifanayo kwizinto ezimbini nangaphezulu – umz. zonke izinto ezimthubi. Ukutshatisa sisakhono esibalulekileyo sokufunda ukubala uthelekisa enye nenye.

ukuthelekisa
ukufumana ukufana nomahluko phakathi kwezinto ezimbini nangaphezulu, umz. 'ezi zizilwanyana zombini kodwa esinye sazo sizuba esinye sibomvu'. Ukuthelekisa kukufumana unxulumano phakathi kwezinto ngokusekelwe kwiimpawu ezithile. Esi sakhono sikhokelela ekwazini ukuhlela izinto.

ukuhlela
ukufumana izinto ezifanayo, okanye ezibufana, kwaye uzibeke ngamaqela ngokweempawu ezithile. Qala uhlele ngophawu olunye, olunje ngombala, umz. 'zonke iimilo eziluhlaza'. Emva koko hlela ngeempawu ezimbini ezinje ngombala nobukhulu, umz. 'zonke iimilo ezincinci eziluhlaza'.

ukulandelelanisa
ukubeka izinto ezintathu nangaphezulu okanye iziganeko zilandelelane- umz. imisebenzi yeklasi yemihla ngemihla, imisebenzi yakusasa yabantwana ('emva kokuba ndivukile ndiyaphakama ebhedini, ndihlambe ubuso, nditye isidlo sakusasa …') okanye iziganeko ebalini

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.

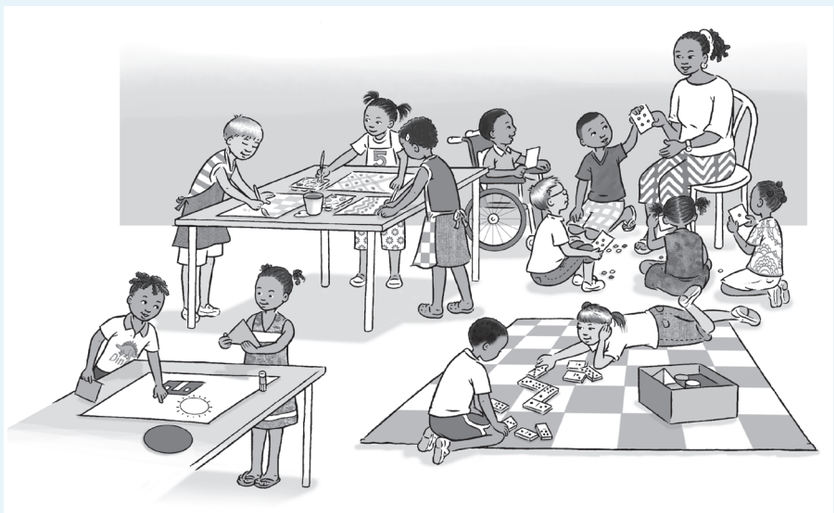


Figure 12 Children learn in hands-on activities.

Abafundi beBanga R kufuneka bafunde ukubala nokulandelelanisa amanani ngeengoma kunye nezicengcelezo, besebenzisa iintshukumo kunye neentshukumo ezinkulu, ezifana nokuqhwaba, ukuxhumaxhuma kunye nokungqisha ukumela amanani ngelixa bebala. Ukubala ngentloko, ukukhuphela amanani ebhodini nokubhala, ukubhala iisimboli zamanani phakathi kwemigca ngepensile akuyondlela ingcono yokufunda ngamanani.

Abafundi kufuneka bakhangele kwaye bapakishe iingqokelela zezinto abanokuthi bazibale kwaye bazileybhelishe ngamagama amanani kunye neesimboli zamakhadi. Kufuneka babhale iisimboli esantini, bawenze besebenzisa iPlastisine, bawapeyinte, okanye bawacinezele kwimiqolo yabahlobo babo. Le ndlela ilungelelaniswe nokubhala okusaphuhlayo kwaye inxulumanisa ulwazi ngesimboli yenani kunye nolwazi ngegama lenani.

Xa kusaziswa inani elitsha, ngumbono omhle ukunxulumanisa igama lenani, isimboli, iintshukumo zomzimba neengqokelela zezinto ngokwasebalini. Oku kungenziwa ngokukhuthaza abafundi ukuba babale izinto ezimfanekisweni, okanye bakhumbule inani lezinto ezisebalini, okanye bangaqhwaba, baxhumaxhume okanye babonise iminwe yabo ukumela inani elisebalini.

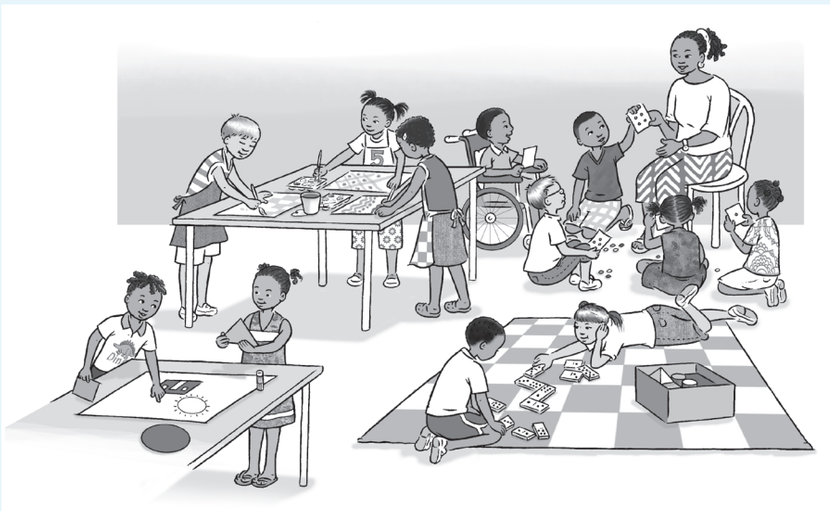
Ukuziqhelisa ...

Utitshala wenza oku kulandelayo:

- Ucwangcisa imisebenzi apho abafundi bathatha inxaxheba elungele iminyaka yabo, inqanaba labo lokukhula nelungele imidla yabo.
- Wenza unxibelelwano phakathi kolwazi abafundi abasele benalo nabakwazi ukukwenza, izimvo ezintsha, ulwimi, iikhonsepthi, kunye/okanye nezakhono eziza kufundwa.

Abafundi:

- bakhululekile ukuba baphonononge, baphande babuze imibuzo
- basebenza kunye, babelane ngezimvo kwaye babuze imibuzo.



Umfanekiso 12 Abafundi bafunda kwimisebenzi ebabandakanyayo.

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. Umgaqo wokudlala

Inkcazelo

Ukudlala kuqulathe imisebenzi eyonwabisayo nekhuthaza ukukhula kunye nophuhliso lomntwana. Ukudlala kunemivuzo kwindlela yokuziphatha, eyentlalo, eyomzimba, eyasengqondweni kunye neyemvakalelo. Ukudlala kuvumela abafundi ukuba babandakanyeke ekufundeni kwabo nasekuphononongeni okubangqongileyo ngenkuthalo. Ukufunda kwiBanga R kufanele kuqulathe imisebenzi eyonwabisayo, exakekileyo kunye namava okusebenzisa izinto ezininzi ezibambekayo kunye nee**simboli**.

ULULHU LWEENKCAZELO

iisimboli
izinto ezibonisa okanye ukumela into, njenge simboli yenani, ilogo okanye iimpawu

Ukufunda ngokudlala

Ebantwaneni, ukufunda nokudlala asiyomisebenzi yohlukeneyo. Ukudlala kungathetha izinto ezininzi; ezifana nemisebenzi yomzimba yangaphandle; ukudlala ngesanti okanye ngamanzi; ukwenza ngathi udlala nabahlobo okanye wedwa; ukudlala ngeebhloko kunye neethoyi zokwakha; okanye imidlalo yokumamela; imidlalo yokuqashela okanye imidlalo yamakhadi. Nangona eminye imisebenzi yokudlala idinga ixesha elongezelelweyo nezixhobo, abantwana bahlala rhoqo bekonwabela ukudlala ngezinto zemihla ngemihla kunye nezixhobo ezilula ezenziwe ekhaya. Ukudlala yindlela abantwana abafunda ngayo ekhaya nasesikolweni. Asiyonto abafundi abayenza 'ngexesha labo lokungenzi nto' okanye utitshala xa engekho.

Abafundi bafuna amathuba amaninzi oku:

- phonononga okubangqongileyo besebenzisa izivo zabo, umz. imisebenzi esebenzisa umzimba eyenziwa phandle efana nokunyuka nokubaleka, okanye imidlalo enemithetho ekufuneka ilandelwe efana nochesi nomdlalo webhola
- ukuphanda nokusombulula iingxaki, umz. besebenzisa izixhobo zokwakha ukwenza isakhiwo esiphakamileyo, okanye besebenzisa amanzi okanye isanti ukugcwalisa izikhongozeli
- ukwenza oko sele bekwazi okanye banokukwenza umz. ukudlala imidlalo ecwangcisiweyo efana neenyoka neeleli okanye iidomino.

Iindidi ezintlanu zokudlala

Abaphandi bachonge iindidi ezintlanu zokudlala ezibonwa kuwo onke amasiko kwaye zixhasa ukuphuhliswa komzimba, kwentlalo, kwemvakalelo kunye nokukhula kwengqondo yomntwana.

- **Ukudlala ngokwasemzimbeni** kubandakanya ukwenza imithambo ngokudlamkileyo, ukuqhelisa izihlunu ezincinci kunye nomdlalo orhabaxa kwaye owisayo. Kubalulekile kulungelelaniso lwezihlunu ezinkulu nezincinci kunye nokwakha ukomelela nokunyamezela.
- **Ukudlala ngezinto** kubandakanya ukuphononga, ukwenza uphando, ukufunisela nokulinga ngezinto ezahlukileyo kwilizwe labo (kokubangqongileyo). Oku kukhulisa izakhono zabo zokucinga kunye nezokusombulula iingxaki.
- **Ukudlala ngomfuziselo** kuxa abantwana besebenzisa ithoyi, into, umfanekiso, umzobo okanye uphawu ukumela ubomi bokwenyani ngezinto.
- **Ukudlala ngokuzenzisa nokwezentlalo** kubandakanya ukunxiba kunye nokulinganisa. Oku kukhuthaza uphuhliso lwengqondo nentlalo kwaye kunceda abantwana ukuba bakwazi ukuziphatha ngokwasezimilweni nangokucinga.
- **Imidlalo enemiqathango** ikhuthaza abantwana ukuba balandele imiqathango yomdlalo, kwaye bafunde ukwabelana, banikane amathuba kwaye bancedane.

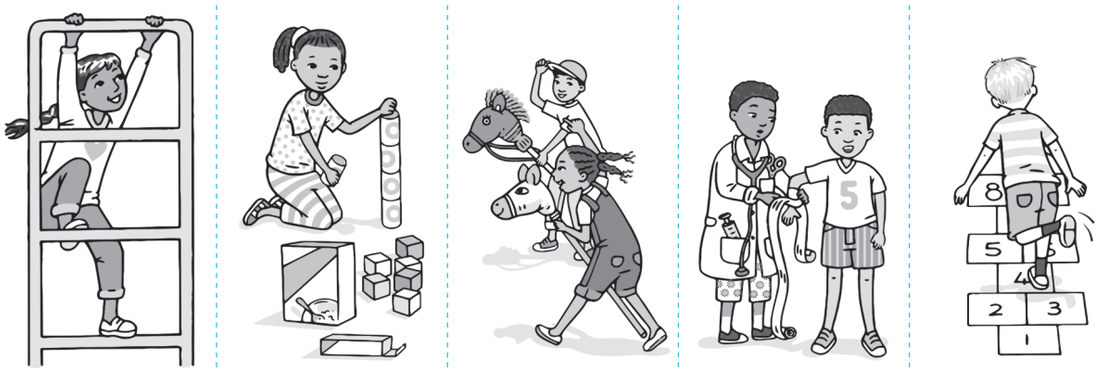


Figure 13 Types of play

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.

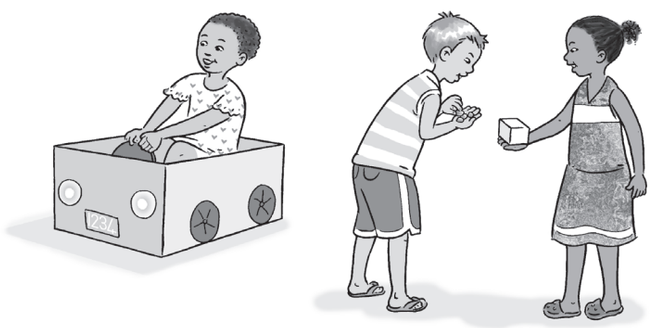


Figure 14 A cardboard box can represent a car, a wooden block can represent an apple and stones can represent money.

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.

Ukudlala ngomzimba

Ukudlala ngezinto

Ukudlala ngomfuziselo

Ukudlala ngokulinganisa nangokwentlalo

Imidlalo enemiqathango

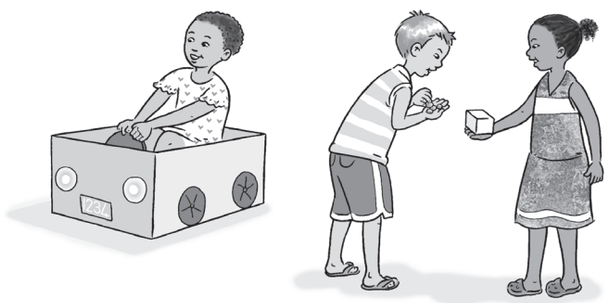
Umfanekiso 13 Iindidi zokudlala

Inkqubo esekelwe ekudlaleni

Inkqubo yokudlala esekelwe ekufundiseni nasekufundeni iqaphela ukuba ngamanye amaxesha abantwana bafunda ngcono kwimisebenzi apho bedlala ngokukhululekileyo eqalwe kwaye neyalelwa ngumntwana ngaphandle kokubandakanyeka komntu omdala. Ngamanye amaxesha abafundi bafunda ngcono kwimisebenzi ekhokelweyo neyalelwa ngutitshala kwiklasi yonke okanye kumaqela amancinci. Inkqubo yokufundisa nokufunda ecwangciswe kakuhle kufuneka ibandakanye ukulingana kwazo zonke iintlobo ezahlukileyo zemisebenzi yokudlala.

Ukufunda iikhonsepthi zemathematika ngokudlala

Ukudlala kubandakanya abantwana bedlala indima yabantu abadala. Umzekelo, bangalinganisa abantu abadala belungisa ukutya, okanye umqhubi wenqwelomoya, okanye utitshala efundisa abantwana. Kule midlalo, basebenzisa izinto ezikwindawo ebangqongileyo balinganise ngathi zezinye izinto, umz. ibhloko yeplanga yokwakha ‘iba’ yibhodi yokunqunqela imifuno. Kolu hlobo lokudlala, abantwana basebenzisa into enye ‘ukumela’ enye.



Umfanekiso 14 Ibhokisi yekhadibhodi ingamela imoto, ibhloko yeplanga ingamela iapile aze amatye amele imali.

Xa abantwana bedlala kwaye bezoba basebenzisa izinto nemifanekiso ukumela izinto zobomi benyani. Esi sisiqalo sokufunda sokuba iisimboli zinokubonisa izinto zokwenyani. Bafunda:

- ukuba umzobo wabantu ababini unokubonisa abantu ababini bokwenyani.
- ukuba iisimboli zinokubonisa ezinye izinto umz. U‘2’ umele izinto ezimbini kwaye nokuba zeziphi na izinto zisenokuba mbini.

- 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

- malunga neengcinga nezimvo, umz. ukushicilela ngebhloko nokuthetha ngemilo eshicilelweyo kunceda abantwana baqonde iimpawu zesikwere.
- **unxulumaniso** lwento kwenye, umz. ezinye izikhongozeli zonela kwezinye, ezinye iibhloko zingaxhasa ezinye iibhloko, izinto zokudlala zokwakha zinamaqhekeza angena kwamanye kodwa ayizizo zonke izinto ezenza loo nto.

ULULHU LWEENKCAZELO

unxulumaniso
indlela izinto kunye nezimvo ezinxulumene ngayo

Zininzi ezinye iindidi zokudlala ezikhuthaza ukufunda imathematika. Nantsi eminye yemizekelo.

- Xa abafundi besebenzisa izikhongozeli ezahlukeneyo ngobungakanani, isanti namanzi ukwakha izakhiwo zesanti, bona bafunda baphonononga iikhonsepthi zomthamo (ngaphezulu/ngaphantsi), ubungakanani (enkulu/encinci) kunye nobungakanani bezinto (zininzi/zimbalwa).
- Imidlalo efana nochesi nokutsibatsiba ikhuthaza abantwana ukusebenzisa ukubala nokuqonda iipateni.
- Abantwana bangaqaphela imilo kunye nobungakanani bezinto ngokubeka izinto (ezifana neebhokisi, neebhola) 'kwingxowa empampathwayo', ngokukhetha into enye aze ayichaze.

Ukuziqhelisa ...

Cwangcisa imisebenzi enika abafundi umdla nebenza bafune ukwazi ngaphezulu ngemathematika.

- Khuthaza umdlalo wokuzonwabisa ngokuthi uqale umdlalo, umz. beka izitulo ngokulandelelana ukwenza uloliwe. Emva koko ke cela umfundi ukuba ahlale ngaphambili abe ngumqhubi kaloliwe okanye esitulweni sesibini okanye kwesesithathu njengomkhweli. Ngale ndlela, abafundi bayazonwabisa kodwa bafunda iikhonsepthi ezifana nendawo nokulandelelanisa amanani.
- Ngenelela wabelane nabafundi ngemisebenzi ngelixa badlalayo. Bonisa ukonwaba nokubandakanyeka kwakho ngokucingela ngaphandle uthetha oko kwenzekayo emsebenzini, umz. 'Ndigcwalise iikomityi ezintathu ngamanzi – inye, zimbini, zintathu. Ngoku ndigcwalisa enye ngaphezulu, ngoku jonga, zine. Jonga indlela entle ezime ngayo!' Ingxoxo yindlela ebalulekileyo ukufundisa ulwimi lwemathematika ebantwaneni.
- Phawula indlela abafundi abathetha ngayo malunga nezimvo zabo zokubala, ukudibanisa nokwabelana ngexesha lokudlala kwabo, uphinde ubanike iziphumo umz. 'Wena ubale amaso amahlanu abomvu namaso amahlanu azuba. Masibale mangaphi amaso onawo ewonke. Kunjalo amaso alishumi.'
- Nceda abantwana bacinge ngeesimboli ngexesha lokudlala. Cebisa indlela into enye enokumela ngayo enye umz. 'Ungaphequla itafile ijonge ezantsi uyisebenzise njengesikhephe sakho.'

4. Umgaqo wenqanaba

Inkcazelo

Izakhono kunye neekhonsepthi zakhela phezu kwenye. Oku kuthiwa k**ukukhula okuqhubekela phambili**. Abafundi basebenzisa ulwazi lwabo abasele benalo nabakwaziyo ukukwenza. Imfundiso elungileyo ixhomekeke kutitshala ukuba afumane oko sebekwazi kuqala nabakuqondayo, emva koko asebenzise imisebenzi kunye neemeko zemihla ngemihla ukwakha nokubanceda ekufundeni ulwazi olutsha nezakhono.

ULULHU LWEENKCAZELO

ukukhula okuqhubekela phambili
indlela izakhono neekhonsepthi ezakhela phezu kwezinye nezilandelelana ngayo

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.

Umfundi ngamnye eklasini yakho uza enamava ahlukileyo. Oku kuthetha ukuba bonke bakwiindawo ezahlukileyo kwiBanga R. Ulwazi lwangaphambili lomfundi ngamnye sisiqalo sazakufunda. Abafundi bangasebenzisa izinto abazaziyo kakade ukufunda iikhonsepthi zemathematika nezakhono.

Ukuziqhelisa ...

- Cwangcisa imidlalo nemisebenzi efanelekileyo ukujonga ulwazi lwangaphambili lwabafundi.
- Qwalasela abakwaziyo ukukwenza xa bedlala, nendlela abalawula ngayo imisebenzi eyahlukileyo.
- Rekhodisha iimfuno nalapho abafundi babonisa ukomelela khona.
- Cwangcisa imisebenzi emitsha eyongeza ulwazi lwangaphambili lomfundi ngamnye nolwazi lwangoku.

Okunye malunga nomgaqo wenqanaba

Ukwahlula

Abafundi kwiklasi yeBanga R bakwiminyaka ebulingana bonke, kodwa emnye kubo wohlukile ngobuntu, ngeemfuno, ngokwazi ukwenza izinto, ngokomelela kunye nemiceli mngeni. Bohlukile:

- ngamava abo asekhaya
- imvelaphi yabo
- imvelaphi yabo yezoqoqosho
- inqanaba labo lolwimi
- imidla yabo
- ulwazi lwabo lwangaphambili
- ukulungela kwabo ukufunda
- isantya ekufuneka bafunde ngaso
- inkxaso abayifunayo evela kootitshala nabanye ukuze bafunde.

Ootitshala kufuneka baqhubeke baqwalasele kwaye babhale phantsi inkqubela yomfundi ngamnye kunye nokukhula kwimathematika. Ukwahluka kuthetha ukuba le into ifundiswayo nendlela ofundisa ngayo kufuneka uthathele ingqalelo ubuchule obahlukeneyo namanqanaba abafundi bakho.

Ukusebenzisa le ndlela, ootitshala kufuneka baqwalasele umfundi ngamnye ngexesha lemisebenzi, ukuqonda abakwazi ukukwenza ngempumelelo, ukuze basebenzise ezi nkcukacha ukucwangcisa imisebenzi nokuxhasa abafundi. Abanye abafundi bangaluqonda uluvo olutsha olunikwa kwimisebenzi ngenkxaso nje encinci evela kutitshala. Abanye abafundi bangafuna ixesha elongezelelweyo, baphinde baboniswe eminye imizekelo nenkxaso eyongezelelweyo esuka kutitshala ukuze bafikelele kwinqanaba lokuqonda.

Khawucinge ngomzekelo apho bonke abafundi kwiklasi yeBanga R bafunda ngesihloko esinye – isithuba kwindawo (kwi-/ngaphantsi, phambi kwe-/emva).

- Abanye abafundi bangawuqonda umahluko phakathi kwesithuba sexesha nje elifutshane nangengcaciso evela kutitshala. Kungekudala baya kukulungela ukudlulela kwikhonsepthi elandelayo – isithuba esikwindawo efumaneka emifanekisweni.

- 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'.

- Abanye abafundi bafuna ixesha elongezelelweyo nengcaciso evela kutitshala xa besenza imisebenzi. Kananjalo baya kugqithela kwikhonsepthi elandelayo kodwa iyakubathatha ixesha elide baze bafune nenkxaso eyongezelelweyo katitshala.

Ukuziqhelisa ...

Ungakwazi ukusebenzisa ukwahluka ekufundiseni kwakho ngo:

- kwazi ukufana nomahluko kubafundi bakho
- kucwangcisa eyona ndlela igqwesileyo yokufundisa umfundi ngamnye ngokusekelwe kwabakwaziyo ukukwenza
- kutshintsha okufundiswayo ukuze kuqwalaselwe ubuchule bokutolika ngokusebenzisa **izakhono nezivamvo**, ulwazi lwangaphambili, umdla kunye nenkcubeko yabo bonke abafundi
- kulungisa, apho kufanelekileyo, oko ukulindeleyo ukuba umfundi ngamnye abe ukufundile ekupheleni komsebenzi
- kucinga ngendlela abafundi abayiyo kunye nobuchule babo bokwenza izinto xa ugqibe ukuba mawenze amaqela ukuze bafunde bancedisane emaqelelni abo
- kusebenzisa imisebenzi efanelekileyo nezixhobo ezifanelekileyo
- kufundisa abafundi abohlukeneyo ngesantya esohlukeneyo, umz. abanye abafundi bangafuna ixesha elongezelelweyo ukugqiba imisebenzi okanye ukuphendula imibuzo kunabanye abafundi
- kusebenzisa imisebenzi yamaqela amancinci ukuze uthathe ingqalelo kumfundi ngamnye unike uncedo olufanelekileyo kubo bonke xa belufuna
- kucwangcisa imisebenzi yabo bafundi bafuna imisebenzi enobunzima obuthe kratya.

ULUHLU LWEENKCAZELO

izakhono nezivamvo
ukusebenzisa izivo zakho uqokelela ulwazi ngobume bendawo, umzekelo: ukubona, ukuva, ukubamba, ukujoja (ukunukisa) nokungcamla

5. Umgaqo wentsebenziswano

Inkcazelo

Ukufunda kubandakanya unxibelelwano kunye nokwabelana ngezimvo. Abafundi kufuneka bakhuthazwe ukuba bathethe nootitshala kunye nabanye abafundi malunga noko bakucingayo nabakwenzayo. Ukwabelana ngezimvo, ngokubuza imibuzo kunye nokucacisa oko bakwenzayo kubanceda ukuphuhlisa ukuqonda iikhonsepthi. Kwakhona kubanceda bafunde ukusebenzisa ulwimi lwemathematika ngokuzithemba.

Ukuziqhelisa ...

- Imeko yaseklasini kufuneka ikhululeke ukwenzela ukuba abafundi bazive bekhululekile ukubuza imibuzo nokwabelana ngezimvo zabo kunye nabanye ngelixa besombulula iingxaki.
- Abafundi abaselula kufuneka bafundiswe ukusebenzisa amagama emathematika ukwenzela ukuba bakwazi ukuwasebenzisa ekuvakaliseni izimvo zabo kunye neengcinga zabo, umz. ukufunda ukuchaza ibhola njenge ‘ngqukuva’ kunokuba athi ‘sisangqa’.

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.

Abafundi bakholisa ukuthi, '*incinci kakhulu*'. Gxininisa ulwimi lwemathematika ngokuphindaphinda into abafundi abayithethileyo, kodwa endaweni yoko usebenzise '*imfutshane kakhulu*'.

Umfanekiso 15 Ootitshala bangabakhokela abafundi ukusebenzisa ulwimi lwemathematika.

Okunye ngomgaqo wentsebenziswano

Unxibelelwano: Ukuphulaphula nokuthetha ngokudlamkileyo

Sifunda kakuhle xa sisenza into sithethe ngayo nomnye umntu, ngababini okanye ngamaqela. Abafundi kufuneka baphuhlise izakhono zokunxibelelana kwaye bakwazi ukuba yinxalenye yencoko. Bafanele ukuba bafunde ukuphulaphula ngomdla oko kuthethwa ngomnye umntu, kwaye baphendule ngokufanelekileyo. Oku kuthetha ukuba kufuneka bakwazi:

- ukuphulaphula oko kuthethwayo
- ukuphendula ngendlela efanelekileyo
- ukunika amathuba okuthetha nawokuphulaphula.

Ukuziqhelisa ...

Bancede abafundi ukuba baphuhlise izakhono zokumamela nezokuthetha ngenyameko ngokubabonelela ngamathuba okuba:

- bangenelele kwincoko okanye kwingxoxo
- baphulaphule ngononophelo ngendlela engaphazamisekiyo
- babelane okanye bavakalise iingcinga nezimvo zabo
- banike iimpendulo nengxelo
- babuze imibuzo
- balandele imiyalelo.

Xa ootitshala bemamela abafundi ngenyameko, abafundi:

- bakhuthazwa ukuba babelane ngezimvo zabo, imibuzo, iingxaki noluvo lwabo
- bamva utitshala enomdla kubo kwaye ebakhathalele ngokuba bayakuqonda
- baphuhlise ezabo izakhono zokuphulaphula ngenyameko.

Ukuphendula ngendlela efanelekileyo kwinto kuyinto ebaluleke kakhulu kunxibelelwano, ekufundiseni nasekufundeni. Xa abafundi befumana iimpendulo ezifanelekileyo kwimibuzo okanye izimvo zabo, bakholelwa ukuba izimvo zabo zibalulekile kwaye zixabisekile. Kwakhona ibabonisa indlela yokuphendula ngokufanelekileyo.

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.

Ukuziqhelisa ...

Unako ukuphendula ngokufanelekileyo kubafundi bakho ngoku:

- ngabavumeli ukuba bacinge ukuba babuza imibuzo ebhanxekileyo
- phindaphinda imibuzo abayibuzayo ngamanye amaxesha, ukuze bayazi ukuba bamanyelwe
- bakhuthaza ukuba babuze imibuzo ecacileyo ngokuba uyibuze ngenye indlela imibuzo, okanye ubacele ukuba baphinde bawubuze ngendlela eyahlukileyo
- kuzama ukuphendula imibuzo yabo ngeendlela ezinentsingiselo kubo, umz. ngokuzoba kulwazi abasele benalo, kunye/okanye ngokusebenzisa imizekelo kumava abo.

Indima edlalwa lulwimi kwimathematika

Sonke sisebenzisa ulwimi ukunxibelelana. Silusebenzisela ukuba sabelane ngezimvo nangolwazi, nokuchaza **iimbono ezingabonwayo**. Ulwimi nalo lubalulekile kwimathematika. Siyalufuna ukuchaza, nokuqonda, ukubuza, ukucinga, ukuqiqa, ukucacisa ukubonisa iikhonsepthi zemathematika.

ULULHU LWEENKCAZELO

iimbono ezingabonwayo
uluvo, ingcinga okanye imvakalelo

gca
chanekileyo, cacileyo

Ulwimi lwemathematika luquka amagama kunye neesimboli esizisebenzisayo ukunxibelelana okanye ukwabelana ngezimvo zemathematika okanye iikhonsepthi. Ngamanye amaxesha sisebenzisa ulwimi lwemihla ngemihla, kodwa ulwimi lwemathematika lucace **gca**. Ungafunda ngokuphangaleleyo malunga nolwazi lwemihla ngemihla kunye nolwazi lwasesikolweni kumaphepha 16–23. Nantsi imizekelo emithathu yoku.

- Kulwimi lwemihla ngemihla igama elithi 'isiqingatha'(ihafu) lingasetyenziswa ukuchaza into engaphezulu okanye engaphantsi ekohlulelwene ngayo kabini ngokomlinganiselo ophantse wafana. Nangona kunjalo, kwimathematika, 'isiqingatha' sithetha amacala amabini ahlulwe ngokulinganayo. La macala afana ngqo ngobungakanani okanye ngenani.
- Kulwimi lwemihla ngemihla singathi, 'Utitshala mkhulu.' Nangona kunjalo, kwimathematika, siya kuthi 'Utitshala mde', silinganise umphakamo/ubude bakhe, sibala 'inye', 'zimbini', 'zintathu', njalo njalo ngelixa sithatha umlinganiselo.
- Kulwimi lwemihla ngemihla singathi, unxantathu yimilo enobutsolo. Nangona kunjalo, kwimathematika, siya kuthi unamacala olulekileyo amathathu neekona ezintathu.

Umfanekiso 16 Ulwimi lwemathematika lucace gca.

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.

Ukuphuhlisa kolwimi lwabantwana lwemathematika

Inxalenye yokufunda iikhonsepthi ezintsha ibandakanya ukufunda ulwimi olutsha. Ootitshala kufuneka bakhokele abafundi kancinane xa beqala ukuqonda nokusebenzisa ulwimi olutsha lwemathematika esikolweni nakubomi babo bemihla ngemihla. Kufuneka bazise abafundi beBanga R isigama esifanelekileyo semathematika esiza kubavumela ukuba balandele imiyalelo, babuze imibuzo kwaye bavakalise iingcinga neengqiqo zabo. Abafundi bazuza ulwimi olutsha nemathematika ngaxeshanye. Njengoko befunda amagama amatsha bafunda iikhonsepthi ezininzi, ngoko ke bafunda amagama neekhonsepthi ezininzi, ze baphumelele ngakumbi kwimisebenzi yabo yemathematika.

Ukuziqhelisa ...

Abafundi abayaziyo intsingiselo yegama elithi 'ngqukuva' nelithi 'mcaba' bayakwazi ukuchaza iimpawu zemathematika ngezinto. Umzekelo, ngokudlala kwabo baye baqonde ukuba izinto ezingqukuva ziyaqengqeleka kwaye izinto ezinamacala amcaba ziyatyibilika. Abafundi abangawaziyo la magama athi 'ngqukuva' nelithi 'mcaba' kuza kuba nzima ukufikelela kwisigqibo kwizinto ekufuneka beziphononongile – iibhokisi ziyatyibilika iibhola ziyaqengqeleka. Abafundi kufuneka bakhuthazwe ukuba bafunde ulwimi olutsha olufanelekileyo ukwandisa ulwazi lwabo ngokuqonda isigama kunye nolwazi.

Umfanekiso 17 Ukuphuhlisa ulwimi lwemathematika ngokudlala

Khuthaza abafundi ukuba basebenzise ulwimi lwabo lwasekhaya kangangoko. Oku kunceda ukuba baphuhlise ubuchule babo kulwimi nezakhono zokucinga. EMzantsi Afrika, abafundi abaninzi beBanga R bafunda ngokusebenzisa ulwimi lwabo lwesibini okanye lwesithathu. Ukufundisa imathematika kunokunceda ukusebenzisa ezi lwimi xa bathe banikwa amathuba okuthetha ukuba benza ntoni ngexesha lemisebenzi yemathematika, ukwabelana ngezimvo nokuxoxa ngezinto abazicingayo.

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)

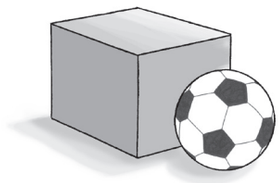


Figure 20

- shape (round, square)

Figure 21

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

Figure 22

- size (big, small)

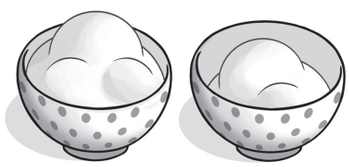


Figure 23

- 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.

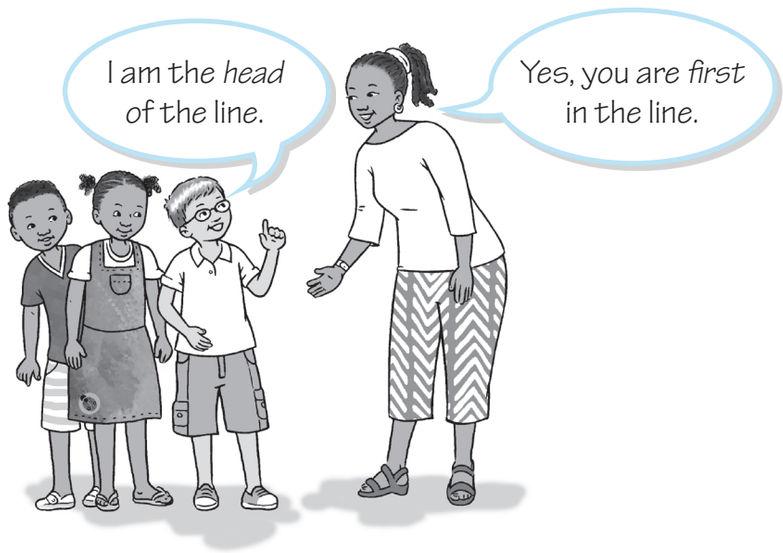


Figure 24 Encourage learners to use maths vocabulary.

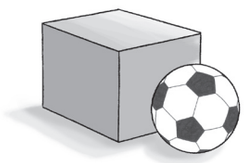
Ukufunda isigama esifanelekileyo semathematika
Abafundi badinga isigama ukuze babenakho ukuthetha nokucinga ngeekhonsepthi zemathematika. Umzekelo, kufuneka bazi amagama afana nala ukuchaza:

Umfanekiso 18

- ubungakanani (kakhulu, ngaphezulu, ninzi, mbalwa)

Umfanekiso 19

- ukubala (dibanisa, thabatha)



Umfanekiso 20

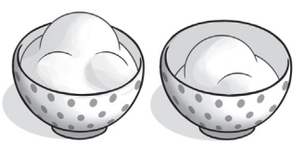
- imilo (ingqukuva, isikwere)

Umfanekiso 21

- indawo (yokuqala, yesibini, yesithathu, yokugqibela, phambi, emva, phakathi)

Umfanekiso 22

- ubungakanani (enkulu, encinci)



Umfanekiso 23

- umlinganiselo (ngaphezulu, ngaphantsi, inde, ibanzi, igcwele, inzima, mde, mfutshane, kusasa, ebusuku)

Khuthaza abafundi ukuba basebenzise isigama semathematika ngokuba usisebenzise wena kuqala xa uthetha nabo malunga neekhonsepthi zemathematika, nangokuphinda izinto abazithethayo ngolwimi lwemathematika. Ekupheleni kweNkalo yomXholo nganye kwiCandelo 3 kukho uluhlu lwesigama semathematika esilungele kanye le Nkalo yoMxholo.

Umfanekiso 24. Khuthaza abafundi ukuba basebenzise isigama semathematika.

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.

Imathematika igxila kulwalamano phakathi kwezinto. Abafundi bafuna ulwimi ukuze bacinge kwaye bathethe ngobu budlelane, okuquka:

- uthelekiso phakathi kwengqokelela (zininzi, zimbalwa, ngaphezulu, ngaphantsi)
- uthelekiso kubungakanani nomlinganiselo (enkulu/incinci, ende/emfutshane, eyona inzima/eyona ilula)
- uthelekiso lwemilo (amacala amathathu, amacala amane, engqukuva okanye ezinamagophe)
- indawo kwisithuba (phambi kwe, emva, phantsi, ecaleni kwe, phakathi)
- ulandelelwano lwezinto (eyokuqala, eyokugqibela, eyesibini, elandelayo, phambi, emva, phakathi)
- uthelekiso phakathi kobungakanani bento (ngaphezulu, ngaphantsi, okufanayo).

Ukuqonda nokusebenzisa iisimboli
Iisimboli zisingqongile. Iimpawu abafundi abazibonayo kubomi babo bemihla ngemihla zinamagama neesimboli kuzo. Abafundi bafunda ukuba la magama neesimboli anentsingiselo. Umzekelo, iisimboli ezibonisa xa kufuneka banqumle indlela okanye ukuba into ixabisa kangakanani na.

Abantwana abancinci balinga ngeesimboli ezibhaliweyo ngokuzoba nokwenza iinzame zokubhala okusaqalayo. KwiBanga R, ukuqonda ulwimi lwemathematika kwakha isiseko sokusebenzisa iimpawu zemathematika ngokuchanekileyo.

Ukuxoxa nokuqikelela
Abafundi kufuneka babenolwimi ukuze:

- balandele kwaye banike uluvo kw**ingqiqo** yomnye umntu.
- bacacise iingcinga zabo kwaye basebenzise oku **kuqikelela** okulandelayo okuza kwenzeka. Bafuna ulwimi ukucacisa ipateni ukuze bachaze okuza kulandela ukuba ipateni isaqhubekeka.

Umfanekiso 25 Uphawu olubonisa ukuba yima nenani u '2' zombini zisimboli.

ULULHU LWEENKCAZELO

ingqiqo
ukucinga ngoluvo okanye ingxelo

ukuqikelela
ukucingela okuzakwenzeka kwixesha elizayo

Umfanekiso 26 Ukuqikelela ukuba yeyiphi imilo elandelayo kulandelelwano.

Ukuziqhelisa ...

Ukukhuthaza uphuhliso lolwimi lwemathematika, abafundi bafuna amathuba amaninzi oku:

- dlala
- chitha ixesha kunye nokunxibelelana nabantu abadala kunye nabanye abantwana
- thetha ngezimvo zabo nengqiqo.

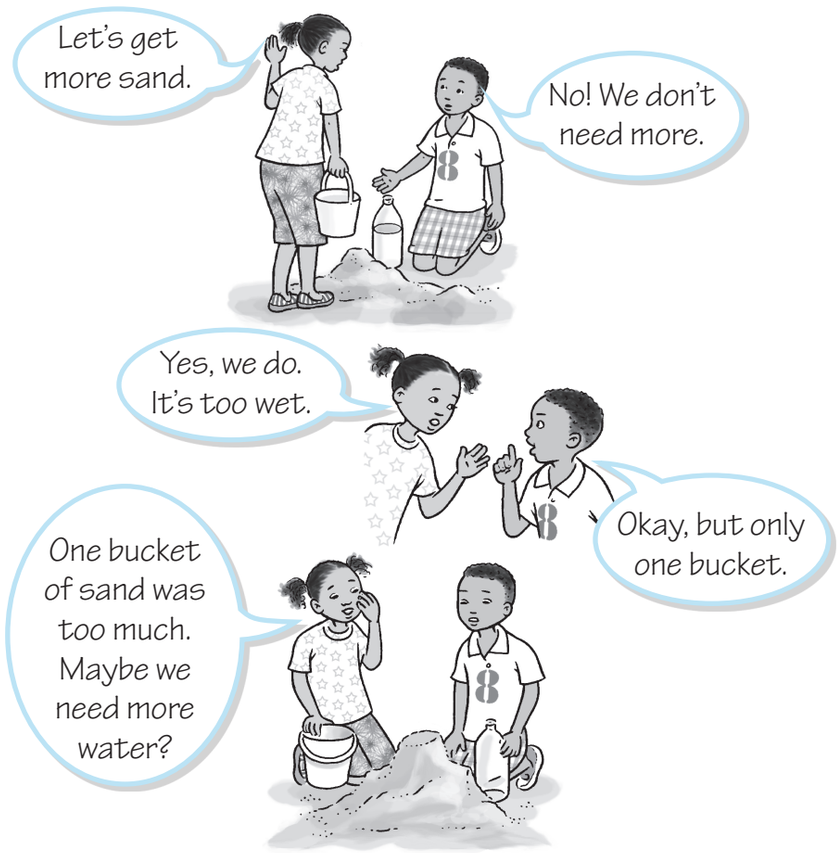


Figure 27 Play is an opportunity to use maths language.

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

Umfanekiso 27 Ukudlala kulithuba lokusebenzisa ulwimi lwemathematika.

Qaphela ukuba abafundi balusebenzise njani ulwimi lwemathematika xa:

- bethetha ngoko bakwenzayo
- bechaza amava abo ngaphandle esikolweni, umz. ekulungiseni itafile yesidlo sasebusuku, xa bedlala umdlalo okanye bechaza ukuba bafika njani esikolweni xa besuka emakhayeni abo
- beqamba amagama bengekalwazi ulwimi oluchanekileyo lwemathematika ngento, umz. ukuchaza ikona njenge 'siphelo esitsolo' okanye igama 'ishumi elinanye' njenge 'shumi elinanyentini'
- beqikelela ukuba kuza kwenzeka ntoni, umz. 'Isakhiwo esiphakamileyo siza kuwa ukuba ndibeka ezinye iibhloko ngaphezulu.'

6. Umgaqo wokukhokela

Inkcazelo

Ootitshala mababakhokele abafundi ekuqondeni ulwazi olutsha. Mabalungiselele imeko yokufundisa nokufunda ukuze kudaleke amathuba okuba abafundi bajolise kwimisebenzi nezinto ezithile, ukwenzela ukuba bahlolisise uluvo nokwabelana ngokucinga ngeengxaki zemathematika. Ootitshala babonisa into eyenziwayo babuze imibuzo ekhokelayo ukunceda abafundi basombulule ingxaki. Oku ngamanye amaxesha kubizwa ngokuba l**ungenelelo**. Ngongenelelo, abafundi baphuhlisa ulwazi olutsha, neendlela zokuziphatha neendlela zokusombulula iingxaki abanokuzisebenzisa kwezinye iimeko.

ULUHLU LWEENKCAZELO

ungenelelo
umsebenzi owenziwa kunye apho umntu owazi ngaphezulu okanye onezakhono ezingaphezulu ekhokela abanye bafunde into entsha

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.

Ukuziqhelisa ...

Indlela yokusebenzisa ungenelelo eklasini

1. Chonga ukuba zeziphi iikhonsepthi nezakhono abafundi abasele bezazi ukwazi ukucwangcisa umsebenzi ofanelekileyo.
2. Nika abafundi umsebenzi ojolise kwiikhonsepthi ezintsha okanye izakhono.
3. Bonisa indlela owenziwa ngayo umsebenzi okanye ubonise ukuba kuphendulwa njani.
4. Nika ingxelo kubafundi ngoko bakwenzayo.
5. Nika iingcebiso okanye imikhondo ukuncedisa abafundi, kodwa ungabaniki iimpendulo.
6. Bakhumbuze abafundi ngokubabuza imibuzo ngoko bakwenzayo.
7. Bakhuthaze abafundi ukuba babuze imibuzo ukuze benze unxulumano olutsha kunye nezinto abazifumanisa ngokwabo.
8. Nika abafundi omnye umsebenzi ukuba bagqibezele ngokwabo bengaxhomekekanga, besebenzisa iikhonsepthi nezakhono abazifundileyo. Kulo msebenzi, kufuneka basebenzise isakhono esitsha okanye ulwazi ngeendlela ezahlukeneyo. Bakhokele ubaxhase, kodwa ungafaki isandla kakhulu.
9. Nika abafundi imisebenzi ethe kratya uze uye uyeka ukubakhokela nokubancedisa, ukwenzela ukuba bazenzele izinto ngokunokwabo.

Okunye ngomgaqo wokukhokela

Iindlela zokufundisa

Ukufundisa kuquka ukusebenzisa iindlela ezahlukeneyo ngamaxesha ohlukeneyo:

- Umyalelo othe ngqo ubandakanya ingxoxo encinci kakhulu. Abafundi bangabuza imibuzo, kodwa oku kunento yokwenza nokulandela imiyalelo. Umyalelo othe ngqo kufuneka ube yinxalenye encinci kakhulu kwindlela yokufundisa.
- Umyalelo okhokelayo ubandakanya ootitshala nabafundi ukuba basebenze kunye ekusombululeni ingxaki okanye ekufundeni iikhonsepthi ezintsha okanye izakhono. Utitshala unika isikhokelo kunye nenkxaso bade abafundi bakwazi ukuzenzela umsebenzi ngokwabo. Ku*Grade R Maths* oku kubizwa ngokuba ngumsebenzi okhokelwa ngutitshala.

Imisebenzi ecwangcisiweyo

- Imisebenzi ecwangcisiweyo yimisebenzi yokufundisa nokufunda, ngokuthi bakhokelwe ngutitshala. Igxila ekufundiseni iikhonsepthi ezithile zemathematika okanye izakhono.
- Kwinkqubo ka*Grade R Maths*, imisebenzi icwangciswe yohlulwa yaba:
  - yimisebenzi yeklasi yonke
  - yimisebenzi yamaqela amancinci akhokelwa ngutitshala
  - yimisebenzi yamaqela amancinci azimeleyo
  - yimisebenzi yokuzikhethela.

Ukubuza imibuzo

Ubuchule bokubuza imibuzo kakuhle bubalulekile ekufundiseni. U*Grade R Maths* ukhuthaza ootitshala ukuba basebenzise imibuzo evulekileyo ekhuthaza abafundi ukuba bacinge ngemathematika. Olu hlobo lwemibuzo lufumaneka kwiingxaki nakuphandonzulu. Imibuzo evulekileyo ikwanceda ootitshala ukuqokelela ulwazi malunga nenqanaba umfundi akulo ekuqondeni nolwazi analo.

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.

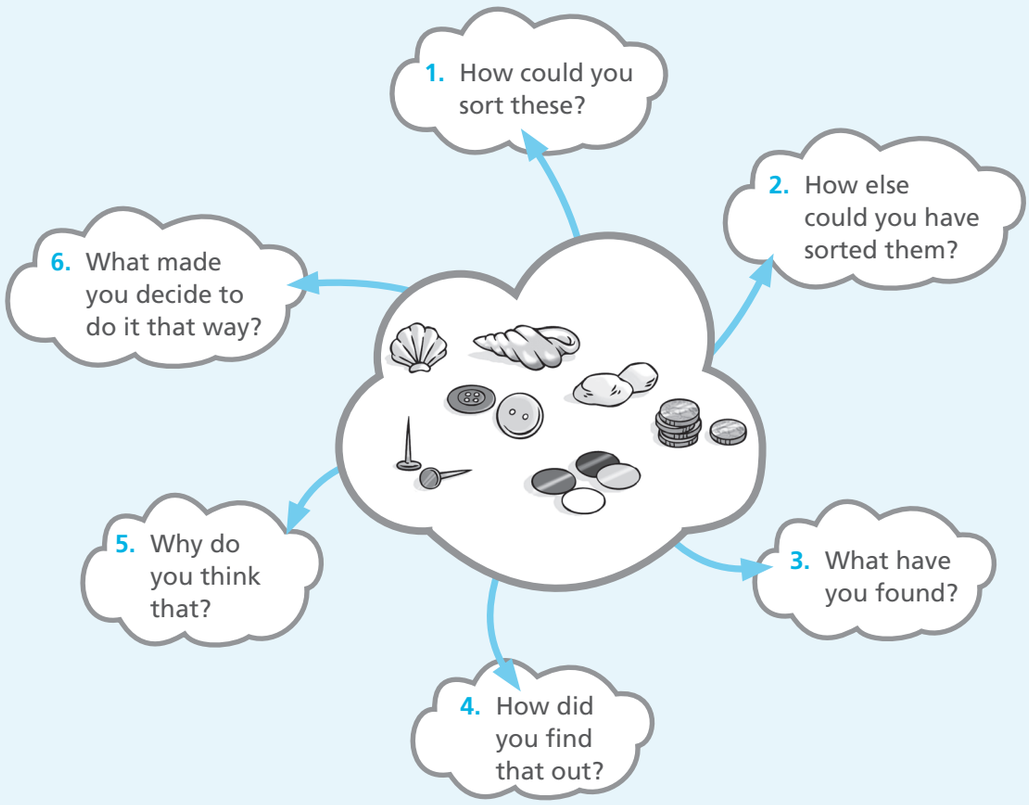


Figure 28 Open-ended questions

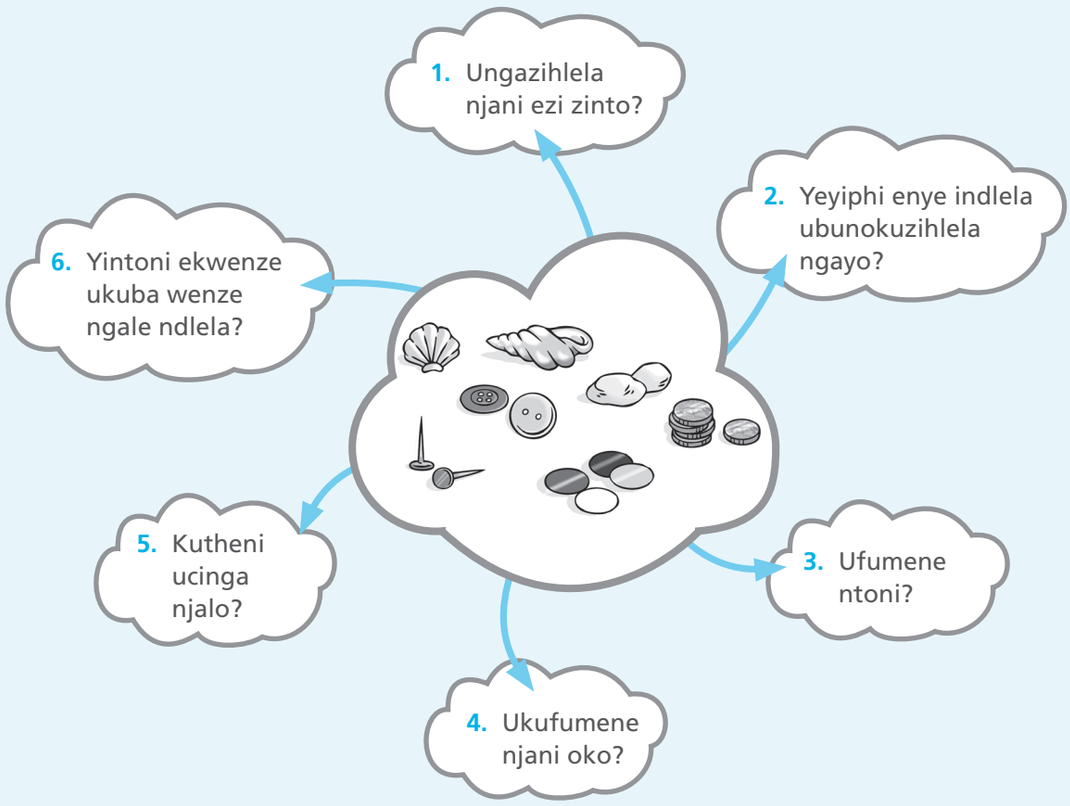
Problem solving

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.

Imibuzo evalekileyo (Imibuzo engacingisi nzulu)	Imibuzo evulekileyo (Imibuzo ecingisa nzulu)
Imibuzo ethe ngqo okanye enempendulo ethi 'ewe'/'hayi'.	Imibuzo eneempendulo ezingaphezu kwenye.
Umzekelo: Ingaba lo ngunxantathu? Umzekelo: Ingaba lo ngunxantathu okanye sisikwere?	Umzekelo: Yintoni ongandixelela yona ngoonxantathu? Umzekelo: Wahluke njani unxantathu kwisikwere?

Ukuziqhelisa ...

- Buza imibuzo enika abafundi amathuba ukuze bacinge ngokuzimeleyo bavakalise indlela abacinga ngayo. Musa ukusebenzisa imibuzo evalekileyo egxininisa ekubeni basebenzise iinkumbulo okanye impendulo ethi 'ewe'/'hayi'.
- Nika abafundi ixesha lokuba bazame ukuphendula umbuzo ukwenzela ukuba bakwazi ukucinga, ukucwangcisa iingcinga zabo baze emva koko bazithethe ngawabo amazwi.



Umfanekiso 28 Imibuzo evulekileyo

Ukusombulula iingxaki

Abafundi bafumana iingxaki abangakwaziyo ukuzisombulula ngokukhawuleza. Ootitshala beBanga R kufuneka baxhase abafundi ukuba baphuhlise izakhono zokusombulula ezi ngxaki ngakumbi ngokuzimeleyo. Oku kuquka ixesha elaneleyo lokuthetha ngengxaki, ukuzama izimvo, ukufunda kwiimpazamo, ukudlala ngengxaki kwaye balungise izimvo zabo ngokusekelwe kuphando olo.

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.

Ukuziqhelisa ...

- Abafundi ngabo abathetha kakhulu.
- Abafundi bayakhuthazwa ukuba bazame izimvo benze neempazamo.
- Abafundi babelana ngokucinga notitshala kunye nabanye abafundi.
- Ootitshala baphulaphula izimvo zabafundi.
- Imibuzo yootitshala ngokubanzi yimibuzo evulekileyo ekhokelela abafundi ekucingeni.

7. Umgaqo woquko

Inkcazelo

Ukuhlonipha **ukwahluka** nokuqukwa ngamalungelo abantwana. Abalulekile kakhulu ukuba sifuna bonke abantwana bafunde baphuhlise iitalente zabo ngokupheleleyo. Ootitshala kufuneka babazi abantwana indlela abayiyo, iimfuno zabo kunye nemidla yabo.

Zonke iiklasi emMzantsi Afrika zahlukile. Kukho abantwana abaninzi abahlukileyo kwaye emnye uzisa ubuyena bakhe, ubuntu, ubuchule, imidla kunye nemvelaphi. **Uquko** luqhelaniso oluqinisekisa ukuba bonke abantwana, nokuba banowuphi umahluko, bayabandakanywa kwimisebenzi eyenziwa eklasini, ingakumbi abo bafundi babeya kubekelwa ecaleni okanye bangathathelwa ngqalelo. Ukukhubazeka *sesinye* sezizathu esibangela abantwana babekelwe bucala, kodwa okubalulekileyo, imiba yokwentlalo, yemvakalelo, yasemzimbeni, nesimo sengqondo zibonisa ukuba ngumqobo ekufundeni. Ootitshala abanengqondo yoquko, bayayamkela iyantlukwano phakathi kwabafundi.

Imfundo equkayo ithetha ukuba bonke abantwana baya esikolweni kwimiyaka efanelekileyo ngokwamabanga. Bamkelekile, bayakhuthazwa ukuba bathabathe inxaxheba kuzo zonke iinkalo zesikolo kwaye bayaxhaswa ukuba bafunde kwaye baphumelele ngokuphelelyo.

ULUHLU LWEENKCAZELO

ukwahluka
iqela labantu abahlukileyo, umzekelo ngobuqu, amandla okwenza izinto, imidla kunye nemvelaphi

uquko
sisenzo esiqinisekisa ukuba bonke abantwana, nokuba banowuphi umahluko, bayabandakanywa kwimisebenzi eyenziwa eklasini

Ukuziqhelisa ...

- Bonke abafundi banelungelo lokuziva bekhethekile, bathathe inxaxheba yaye babandakanywe kwimisebenzi neengxoxo zaseklasini. Oku kubandakanya abantwana abakhubazekileyo, imiba engendlela yokuziphatha okanye eminye imiqobo ekufundeni.
- Bonke abafundi, nabazali babo kunye nabasebenzi besikolo kufuneka bamkelekile, oku kuquka, ukuphathwa ngokufanelekileyo nokuhlonitshwa kungajongwanga nkcubeko, ubuzwe, ubuhlanga, isini, isazisi sobuni, ukwaziswa kwindlela yokuziphatha kwisini, inkangeleko ngokwasemzimbeni okanye ngokwasengqondweni, inkolo okanye imo yezentlalo noqoqosho.

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.

Okunye kumgaqo woquko

Iindlela ezahlukeneyo zokufunda

Ukwahluka akukho kuphela malunga neempawu zethu zomzimba, iinkolelo, okanye ukholo, kusenokubandakanya indlela esifunda ngayo izakhono ezintsha. Asingabo bonke abantwana abafunda ngendlela efanayo. Kukho uluhlu lweendlela ezahlukileyo zokufunda ezifanelekileyo kumfundi ngamnye. Umzekelo, asingabo bonke abafundi abanokulandela imiyalelo katitshala ngokumamela kwinto ayithethayo qha. Abanye abafundi bangaxhamla ekuboneni umfanekiso omele into abafanele ukuyenza. Abanye basenokudinga intshukumo okanye umsebenzi oxakekisayo ukuze baqonde ngokuphelelyo umyalelo okanye ikhonsepthi.

Ukuziqhelisa ...

Ootitshala abaphumeleleyo bayakwazi ukuchonga iimfuno zomfundi ngamnye kwiiklasi zabo kwaye balungelelanise imisebenzi ukuze ilungele ngcono iimfuno zomfundi ngamnye. Ezi ndlela zisibhozo zokufunda zilandelayo zikufanele ukufunda nokufundisa kwiBanga R:

- Okubonwayo (Indawo): Ukufunda okubonwayo kubandakanya ukusetyenziswa kwemifanekiso okanye imizobo ukukhumbula ulwazi. Abanye abafundi baqonda kwaye bakhumbula ulwazi lula xa lumelwe yimifanekiso okanye imizobo.
- Okuviwayo (Isandi): Ukufunda okuviwayo kuxhomekeka ekumameleni kulwazi nokukhumbula ukuze uqonde kwaye ukhumbule ngokupheleleyo. Abanye abafundi bafunda ngcono xa bekwazi ukumamela kutitshala, okanye kwingoma okanye kwirekhodi.
- Okomlomo (Ulwimi): Ukufunda ngomlomo kubandakanya ukuthetha nokuvakalisa phandle iimbono, nokuzoba okanye ukubhala ukuqonda ngokupheleleyo kwaye ukhumbule ulwazi.
- Okomzimba (Okwasemzimbeni): Ukufunda ngokomzimba kwenzeka xa umfundi ebandakanyiwe ngokwasemzimbeni, kwimisebenzi exakekileyo. Aba bafundi basebenzisa imizimba yabo kunye nemvakalelo yokubamba (okubanjwayo) ukuqonda ulwazi.
- Okwengqiqo (Okwemathematika): Ukufunda ngengqiqo kubandakanya ukusebenzisa ingqiqo nengcinga ukuqonda ulwazi. Abafundi abanengqiqo basebenzisa ingqiqo kwaye bajonge izizathu xa befunda izinto ezintsha.
- Okwentlalo (Uluntu): Ukufunda kwentlalo kubandakanya ukufunda nabanye. Abanye abafundi bakhetha ukufunda beyinxalenye yeqela, okanye nomhlobo.
- Okukodwa (Ukuba wedwa): Ukufunda uwedwa kubandakanya ukuzifundela. Abanye abafundi baqwalasela ngcono xa bekwazi ukugxila kwiingcinga neemvakalelo zabo bebodwa, ngaphandle ngokuphazanyiswa ngabanye.
- Okwendalo (Indalo): Ukufunda ngendalo kwenzeka kwindalo. Abanye abafundi bafunda kwaye baqonda ngcono xa bekwazi ukuphononongo kwaye baphande ngendalo ngokwamava abo angaphandle, afana nokuqaphela izilwanyana, igadi, ukukhathalela umhlaba okanye baphononongo okubangqongileyo.

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.

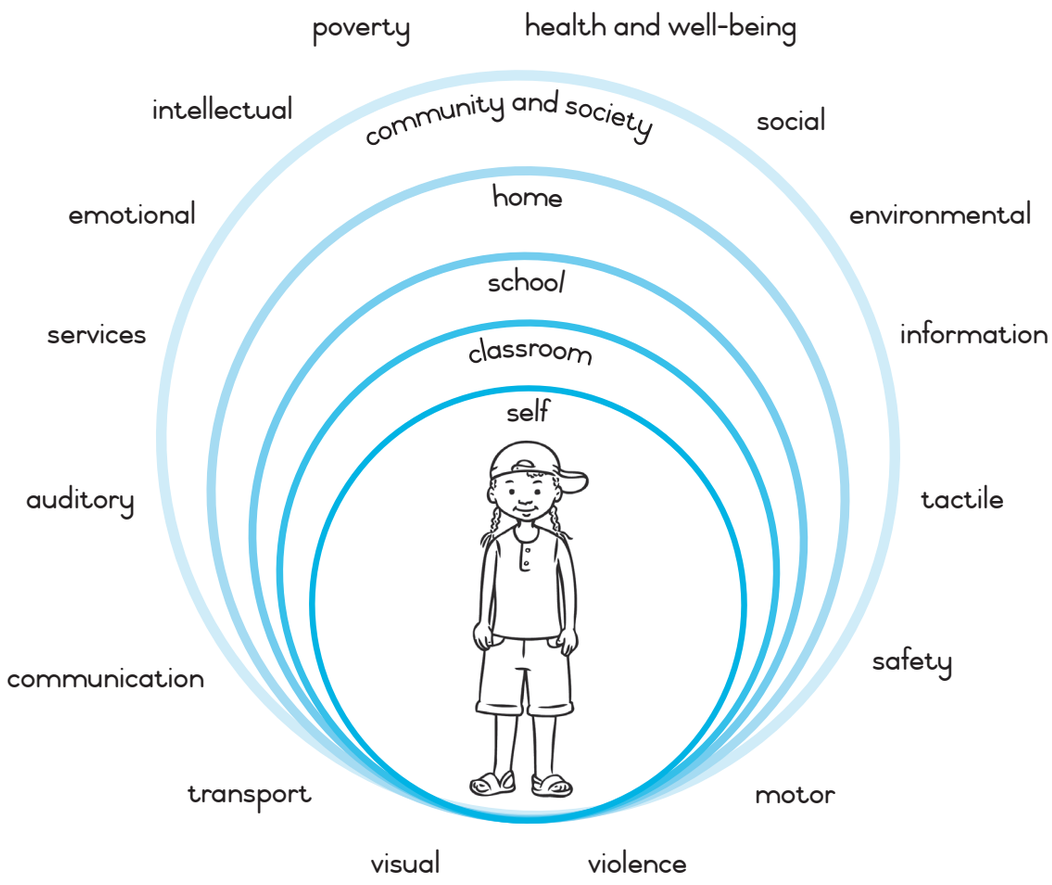


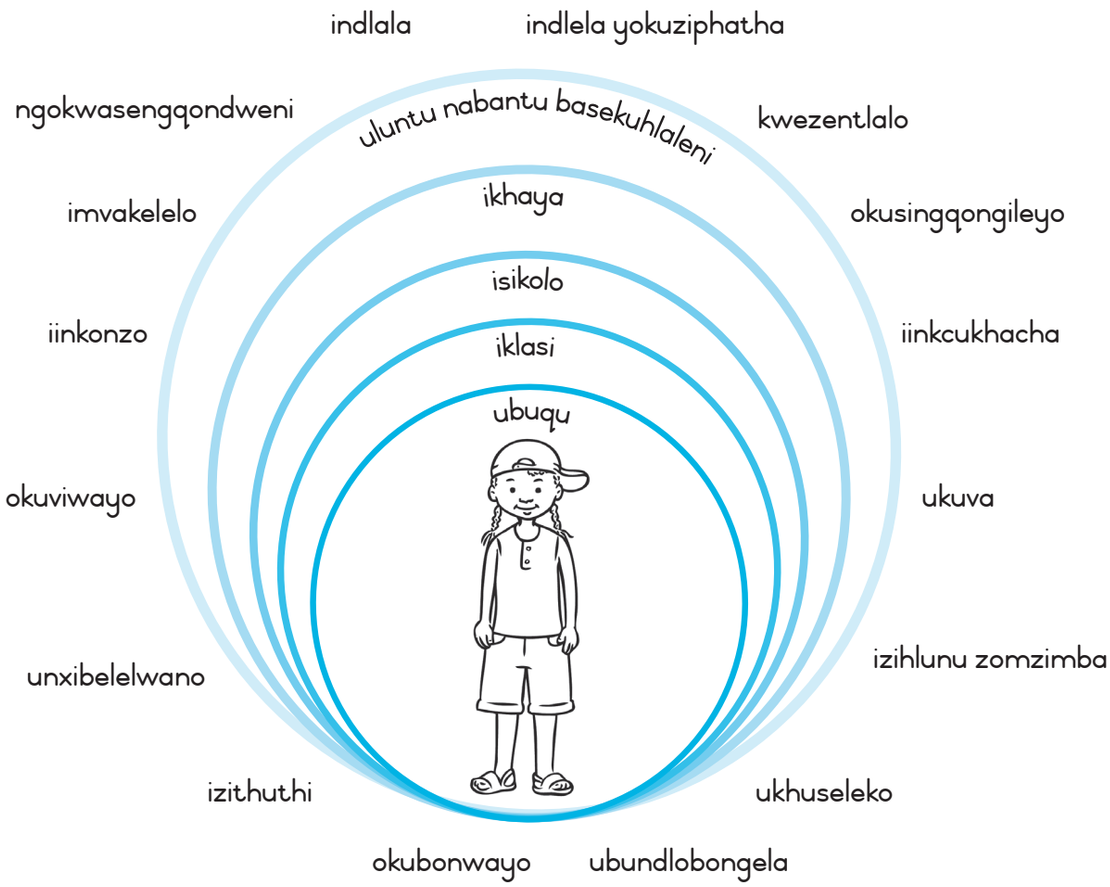
Figure 29 Barriers to learning

Imiqobo ekufundeni imathematika

Umqobo ekufundeni yiyo nantoni na ethintela umntwana ukuba afunde ngempumelelo. Imiqobo inganxulunyaniswa ngqo nomntwana (okungaphakathi), umzekelo, ukukhubazeka ngokwasengqondweni, usizi okanye ingalo eyaphukileyo. Imiqobo ingabonakala ngaphandle emntwaneni (okungaphandle), umzekelo, indlala, ukungahoywa okanye iklasi egcweleyo.

Ulwimi sisixhobo sokufunda esibaluleke kakhulu. EMzantsi Afrika oku kuhlala kubonakaliswa njengomqobo kukufunda okungaphakathi nokungaphandle, ingakumbi apho ulwimi lwasekhaya lomntwana lwahlukileyo kulwimi lokufundisa nokufunda.

Abantwana abaninzi bafumana umqobo omnye okanye engaphezulu ekufundeni. Basenokufuna uncedo olongezelelweyo nenkxaso kunabanye abafundi. Imiqobo ekufundeni zizinto ezibangela kube nzima kwabanye abafundi ukuba bafunde imathematika. Imizekelo yemiqobo ibonisiwe kumzobo olandelayo.



Umfanekiso 29 Imiqobo ekufundeni

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.

Ukuziqhelisa ...

Ezinye iindlela apho ungaquka bonke abafundi eklasini yakho yeBanga R zezi zilandelayo:

- Cwangcisa izifundo zakho, imisebenzi kunye nezixhobo zokusebenza ezifanele iimfuno zabafundi ezahlukeneyo, umz. ingxaki zemathematika ezisekelwe emfanekisweni kungafuneka zibandakanye inkcazelo eneenkcukacha ezicacileyo ukwenzela ukunceda abafundi ukuba bajolise kwiinkalo ezibalulekileyo emfanekisweni.
- Sebenzisa imisebenzi eyenziwayo usebenzise izinto zokwenyani.
- Nika abafundi ixesha elongezelelweyo nenkxaso ukuze bagqibe imisebenzi, ukucinga kunye/okanye ukuphendula imibuzo, ukuba bafuna oko.
- Kusenokuba luncedo ukuxoxa ndawonye nabanye ootitshala okanye iqela lesikolo elinika inkxaso ngenqanaba osebenza ngalo nomfundi ukuze uqinisekise ukuba umnika inkxaso kangangoko. Kusenokufuneka ukuba ulandele abazali okanye abagcini babantwana kunye neqela lenkxaso lesithili ukunika umfundi onke amathuba emfundo nophuhliso.

Izikolo kufuneka ziqinisekise ukuba zonke iiklasi nootitshala banezixhobo ezaneleyo nezifanelekileyo zikwalungele bonke abantwana, ngaphandle kwemiqobo ekufundeni. Oku kubandakanya:

- ootitshala abaqeqeshelwe ukuchonga imiqobo ekufundeni
- ukwahluka kweendlela zokufundisa
- ubume beklasi obugqibeleleyo
- umlinganiselo weklasi olawulekayo
- abancedisi eziklasini.

Ukuziqhelisa ...

- Vavanya bonke abafundi xa besamnkelwa kwiBanga R kwaye urekhodishe iziphumo zakho kwiProfayili yoMfundi ngamnye ngokwePolisi yeliZwe yokuKhangela, ukuChonga, uHlolo kunye neNkxaso (Screening, Identification, Assessment and Support (SIAS)) yabafundi bonke.
- Phuhlisa isiCwangciso seNkxaso somfundi ngamnye (Individual Support Plan (ISP)) obonakalisa imiqobo ekufundeni. Olu lwazi kufuneka kwabelwane ngalo nabazali kunye/okanye abagcini babantwana ukuze bazi ngeemfuno ezongezelelekileyo kunye nesicwangciso senkxaso somntwana wabo.
- Sebenzisana neQela leNkxaso elisekwe eSikolweni ukunika inkxaso eyaneleyo. Umfundi uthunyelwa kwiQela leNkxaso leSithili ukuba inkxaso eyongezelweyo iyadingeka.

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.

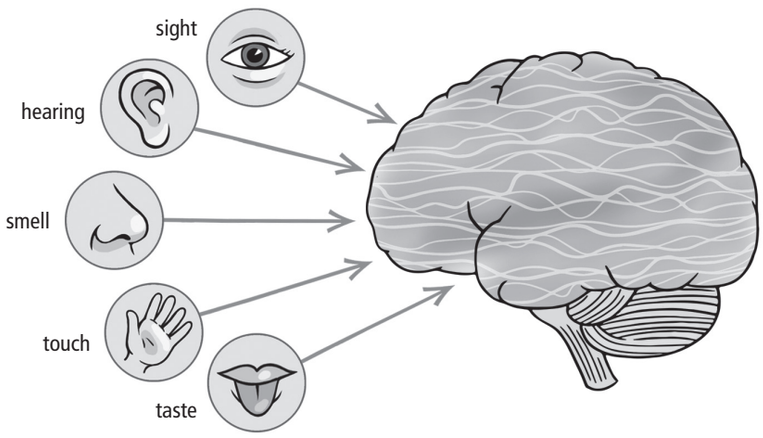


Figure 30 Our five senses

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?

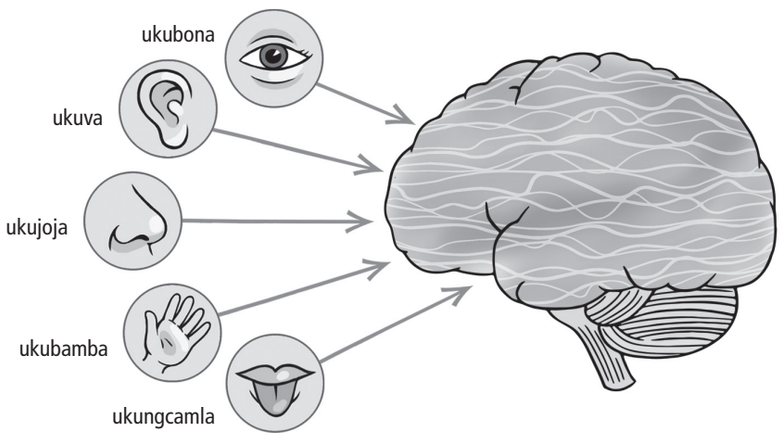
Uphuhliso lwamalungu kunye nolwezihlunu

Ukuphuhliswa kwezakhono zembonakalo kunye nezihlunu kubaluleke kakhulu kubafundi abatsha nasekuphuhliseni isiseko semathematika. Imbonakalo zezivamvo ithetha ngokusebenzisa izivo ukufumana ulwazi malunga nokusingqongileyo. Izakhono zembonakalo yezivamvo zibalulekile ekufundeni imathematikakuba zisinceda siqonde:

- iindlela ezinxulumana ngayo izinto
- iimfano neeyantlukwano
- ubukhulu, imilo kunye nepateni
- isithuba nendawo
- iisimboli kunye neentsingiselo zazo.

Izakhono zokubonakalayo zisivumela ukuba senze umbono ngelizwe elisingqongileyo. Ulwazi lwezivamvo luqokelewa zizivo ezintlanu, umzekelo, okubonwa ngamehlo ethu, okuviwa ziindlebe, okuvakalelwa lulusu, okungcamlwa lulwimi kunye nokunukiswa ziimpumlo.

Olu lwazi luthunyelwa kwiingqondo zethu. Ingqondo ihambisa, ilungelelanise kwaye ikhumbule olu lwazi ukwenzela ukuba sikwazi ukulusebenzisa kwilixa elizayo kwimisebenzi yemihla ngemihla, efana nokufunda, ukuzoba, ukubhala, ukusika, ukugqibezela iiphazili, ukugqibezela iingxaki zemathematika, ukonwabela amabali, ukunxiba, ukufumana izihlangu zakho ekhabhathini, ukucula kunye nezinye izakhono ezininzi.



Umfanekiso 30 Izivo zethu ezintlanu

Ukuziqhelisa ...

Qwalasela abafundi bedlala ngezixhobo ezahlukileyo ngaphandle nangaphakathi.

Banga:

- wuxela umahluko phakathi kwezandi ezahlukileyo, amagama ohlukileyo?
- wubona umahluko phakathi kwemifanekiso emibini okanye amaqela ezinto?
- kukhumbula abakubonileyo nabakuvileyo?
- luphinda uluhlu lweenkcazelo okanye amanani ngolandelelwaniso oluchanekileyo?
- phendula kwizandi ezahlukeneyo, amagama azo, imiyalelo?
- wuva umahluko phakathi kompuluswa norhabaxa?
- wungcamla umahluko phakathi kobuswiti nobumuncu ngelixa begqunywe amehlo?

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.

Izakhono zezihlunu zomzimba zibandakanya ukusebenzisa izihlunu zethu. Sisebenzisa izihlunu ezinkulu emizimbeni yethu ukulungela imisebenzi eshukumisayo, umz. ngokukhaba ibhola, ukubaleka nokuxhumaxhuma. Sisebenzisa izihlunu ezincinci ukwenza imisebenzi esebenzisa imizimba/amalungu, umz. ukusika, ukubhala kunye nokuzoba.

Uphuhliso lwembonakalo yezivamvo luquka oku kulandelayo:

- umbono wokubonwayo
- umbono wokuviwayo
- umbono wokubanjwayo
- umbono weentshukumo zomzimba.

U*Grade R Maths* uyakuqonda kakhulu ukubaluleka kwezi zakhono ukuphuhlisa iikhonsepthi zemathematika kubafundi beBanga R.

Ukutolika into ebonwayo
Ukutolika into ebonwayo yindlela ingqondo ekwazi ngayo ukusebenzisa oko amehlo akubonayo kuze kutolikeke olo lwazi. Izakhono zokutolika oko kubonwayo zibalulekile ekusebenziseni izinto, ukuzoba, ekufundeni nasekubhaleni imathematika.

Ukwahlula izinto ezibonwayo

Ukwahlula izinto ezibonwayo kukwazi ukubona umahluko nokufana phakathi kwezinto. Umzekelo, ukuqaphela okufanayo nokwahlukileyo phakathi kweemilo ezingu2-D ezinjengomfanekiso wesikwere nowoxande.

Ukubona nezihlunu zomzimba zisebenza kunye

Ukubona nezihlunu zomzimba zisebenza kunye namehlo, kukuba amehlo, ingqondo nezihlunu zomzimba zikwazi ukusebenza kunye ekwenzeni iintshukumo. Kwimathematika, ibalulekile imisebenzi efana nokuphatha izinto, ukuzoba nokubhala.

Imisebenzi enceda ukuphuhlisa ukubona nomzimba kusebenze kunye iquka:

- imidlalo yebhola neyengxowa yeembotyi
- ukusebenzisa iibhloko zokwakha
- ukudlala ngezinto eziqengqelekayo okanye ezityibilikayo
- ukuzoba iipateni
- ukusika nokuncamathisela
- ukuhlohla umsonto enalitini.

Ukugqibezela ngokubona

Ukugqibezela ngokubona kukwazi ukugqibezela izinto, imifanekiso okanye imizobo engagqitywanga. Ngamanye amazwi, umfundi uyakwazi ukubona okanye ukuqaphela into ephelelelyo nangona umfanekiso wento ungaphelelanga. Abafundi abanengxaki yokugqibezela ngokubona bafumanisa ubunzima, umzekelo ukugqibezela iiphazili. Bangaba nobunzima ekuchazeni okungaphelelanga emfanekisweni obonisa kuphela icala lasekunene lobuso okanye lomzimba, okanye ekugqibezeleni umfanekiso.

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.

Ukuqaphela nokutolika izimo neesimboli (ukuqaphela)

Ukuqaphela izimo kukwazi ukuchaza umahluko phakathi kwezimo neesimboli, nangona ubungakanani nendawo bungatshintsha. Ngamanye amagama, oku kuthetha ukuba unako ukuqonda iimpawu ezingundoqo zento. Umzekelo, isangqa sisangqa ngenxa yemilo yaso. Sihlala sisisangqa nokuba umbala uzuba, umsobo, sikhulu okanye sincinci, sisencwadini okanye sizotywe esantini. Ngendlela efanayo, isimboli yenani u'5' ihlala ifana nokuba ibhalwe ngemibala eyahlukeneyo okanye ibhalwe yankulu okanye yancinci.

Umbono wokubonwayo ngasemva

Ukutolika okubonwayo ngasemva kukwazi ukubona umahluko phakathi kwezinto eziphambili kunye nezo zingasemva. Unganako ukubanceda abafundi ukuba baphuhlise esi sakhono ngokubacela ukuba bachonge izinto ezithile ezisemfanekisweni okanye ingqokelela yezinto, umz. 'Fumana intombazana enebhulukhwe ebomvu emfanekisweni' okanye 'Fumana ibhokisi enamaorenji emfanekisweni' okanye 'Fumana izihlangu zakho kule mfumba yazo zonke izihlangu zethu'.

Ukulandelelanisa ngokubona

Ukulandelelanisa ngokubona kukwazi ukubeka izinto ngendlela echanekileyo emva kokuba uzibonile okanye uzijongile. Ncedisa abafundi ukuphuhlisa esi sakhono ngokuthi bajonge ipateni yamaso enemibala eyahlukileyo kumtya emva koko bagqibezele ipateni ngokwabo.

Ukudibanisa okubonwayo nomzimba

Ukudibanisa okubonwayo nomzimba kukwazi ukwenza ingqiqo/ukuqonda ngolwazi olubonakalayo uze ulusebenzise komnye umsebenzi ofuna izakhono zomzimba. Abafundi basebenzisa ulwazi olubonwayo nezakhono zomzimba xa, umzekelo, bekhuphela amanani okanye bezoba izinto eziphambi kwabo.

Ukuyila okusengqondweni

Ukuyila okusengqondweni kukwazi ukwenza imifanekiso esengqondweni yakho (imifanekiso ngqondweni) esekwe kumava, ukuqwalasela okanye kwenye inkcazelo ebonakalayo. Abafundi basebenzisa esi sakhono xa, umzekelo, bezoba imifanekiso into efana negumbi emakhayeni abo okanye iintsapho zabo.

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.

Umbono wokuviwayo
Umbono wokuviwayo kukusebenza kwengqondo isebenzisa into eviwa ziindlebe nokuyitolika. Umbono wokuviwayo ubalulekile ekuphuhliseni izakhono zolwimi, ukulandela nokuqonda imiyalelo kwakunye nokwabelana nokuxoxa ngamava nolwazi.

Ukwahlula okuviwayo

Ukwahlula okuviwayo kukwazi ukuqaphela imfano nomahluko kwizandi, umz. ukuba nako ukuva umahluko phakathi kwamagama 'uxande' nelithi 'unxantathu'.

Ukukhumbula okuvileyo

Ukukhumbula okuvileyo kukwazi ukugcina nokukhumbula into oyivileyo. Abafundi basebenzisa esi sakhono xa belandela iseti yemiyalelo okanye ephinda ulandelelwano lwamanani olufundwa ngokuvakalayo, umz. 4, 6, 8, 1.

Umbono wokuviwa ngasemva

Umbono wokuviwa ngasemva kukwazi ukuqaphela okanye ukwahlukanisa isandi kwezinye izandi. Ikwakukwazi ukuthatha ingqalelo kwisandi esithile bucala ngaphandle kokuphazamiseka kwingxolo evakalayo ngasemva. Esi sakhono sibangela abafundi bamamele kumntu othethayo kwiqela labo ngaphandle kokuphazamiseka yingxolo yabanye kwelinye iqela.

Ukulandelelanisa okuvileyo

Ukulandelelanisa okuvileyo kukwazi ukukhumbula izinto okanye izinto ezibekwe ngendlela echanekileyo emva kokuva uluhlu. Umzekelo, ulandelelwano lwamanani ukusuka ku1 ukuya ku10 okanye iinyanga zonyaka. Ukucela abafundi ukuba bachaze ngeziganeko zosuku ngolandelelwano kunceda ukuphuhlisa esi sakhono.

Umbono wokubanjwayo kunye neentshukumo zomzimba
Umbono wokubanjwayo kukwazi ukusebenzisa izivo zokubamba nokuphononongo isimo. Imbono yomzimba kukwazi ukusebenzisa iintshukumo zomzimba kwisithuba sendawo. Zisebenza kunye ukunika ingqondo ulwazi. Umsebenzi onceda abafundi ukuphuhlisa umbono wokubanjwayo kunye neentshukumo zomzimba kukuba ucele abafundi bavale amehlo, babambe izinto ezahlukeneyo ezisengxoweni okanye ezikwingxowa yomqamelo. Umzekelo, bangathi ineekona/ingqukuva.

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. Umgaqo wokuziqhelisa

Inkcazelo

Abafundi mababe nexesha elaneleyo lokuziqhelanisa nezakhono ezintsha kunye nolwazi. Xa abafundi befumana ukuziqhelisa okwaneleyo koko bakufundileyo, bayazithemba babenolwazi ngakumbi. Bayaluthanda uphindaphindo nokuziqhelanisa. Utitshala weBanga R kufuneka abonelele ngamathuba okuphindaphinda ukuze bakhulise izakhono zabo.

Ukuziqhelisa ...

- Ukubala nokusombulula ingxaki kwenziwa yonke imihla njengemisebenzi yarhoqo – nokuba kujoliswe kwezinye iikhonsepthi ezifana nemilo okanye imilinganiselo.
- Nika izinto ezahlukeneyo nemisebenzi ukwenzela abafundi baziqhelanise nezakhono ezintsha ngeendlela ezahlukeneyo.
- Iikhonsepthi zemathematika zingaqhelaniswa kwikharityhulam jikelele, umzekelo kwimisebenzi yoLwimi lwaseKhaya neZakhono Zobomi ezifana namabali, idrama, ukupeyinta, kunye nezifundo zomqobo.

Okunye ngomgqago wokuziqhelisa

Ukusebenzisa izicengcelezo, iingoma kunye namabali

Ukucula iingoma nokuphindaphinda izicengcelezo kunye nokwabelana ngamabali kuyonwabisa, yindlela yokufunda engenakhuphiswano. Abantwana bafunda iikhonsepthi zemathematika nezakhono xa bephindaphinda izicengcelezo neengoma, bamamele amabali rhoqo. Bafunda baziqhelise:

- amagama amanani (umz. 'Kukho amagala amathathu …')
- ulandelelwano lwamagama amanani
- ukubala usiya phambili nokubala ubuya umva
- ukubala amaqela ezinto
- ukubala ngokungekho sikweni, umz. ukudibanisa nokuthabatha
- ukulandelelana kweziganeko.

Ukuziqhelisa ...

- Yongeza intshukumo, isingqisho nomculo kwiingoma, izicengcelezo namabali ukuwenza abemnandi ngakumbi. Amava asebenzisa zonke izivo zethu zinceda abafundi ukuba bakhumbule izinto lula.
- Khuthaza abazali nabagcini bantwana ukuba bafunde amabali, iingoma nezicengcelezo nabafundi. Ngale ndlela, iba likhonkco elubalulekileyo phakathi kwekhaya nemisebenzi yesikolo.

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.

Udityaniso lweMathematika kwinkqubo yemihla ngemihla yeBanga R

Ootitshala kufuneka benze unxibelelwano phakathi kwemathematika, inkqubo yemihla ngemihla nezinye izifundo (umz. uLwimi LwaseKhaya neZakhono zoBomi), ngokunjalo phakathi kwemathematika nobomi babafundi bemihla ngemihla. Ootitshala kufuneka basebenzise onke amathuba okuziqhelanisa nezakhono zemathematika.

Ukuziqhelisa ...

Abafundi badla ngokubonisa umdla ekufundeni imathematika, bafumane kulula ukuziqonda, ukuba bangayibona indlela imathematika eyenza intsingiselo ngayo nokusetyenziswa kwayo kwimpilo yabo abayiphilayo. Ootitshala banganceda ngokwenza oku kulandelayo:

- Ukwazi ngaphezulu ukuba imathematika iyinxalenye yobomi babo ababuphilayo.
- Ukubonisa abafundi indlela imathematika esetyenziswa ngayo kubomi bemihla ngemihla, umz. xa usebenzisa imali uyokuthenga.
- Ukunxibelelanisa imisebenzi yemathematika kumava aseklasini nawangaphandle anje ngo:
  - kusebenzisa amanani endawo, 'owokuqala', 'owesibini' kunye 'nowesithathu' xa abafundi besima ngomgca
  - kubhekisele kwindawo xa abantwana bedlala
  - kuthetha ngo'ngaphezulu' kunye no'ngaphantsi' xa abafundi besabelana ngeziqhamo, isonka/okanye isiselo.
- Ukunxibelelanisa iikhonsepthi zemathematika ezifana nobukhulu, umlinganiselo, ixesha, uqikelelo, ukubala, ukuthelekisa, imilo kunye/okanye umgama xa ufundela abafundi amabali.

Fundisa iikhonsepthi zemathematika ngexesha eligxile kwimathematika yeBanga R uze ukhangele amanye amathuba okuphuhlisa ulwimi lwemathematika neekhonsepthi ekuhambeni kwemini. Oku:

- kunceda abafundi baphuhlise ukuqonda ulwazi olwahlukeneyo lwezinye izifundo ukuba lunxulumene
- kuqinisekisa indlela egqibeleleyo yokufunda namava apheleleyo
- kunika abafundi amathuba amaninzi okuziqhelanisa noko bakufundileyo.

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

ICANDELO 2

IMathematika kwiNkqubo yeMihla ngemihla yeBanga R

Intshayelelo

Inkqubo ka*Grade R Maths* iphuhliselwe ukomeleza nokuxhasa ikharityhulam yeMathematika yeBanga R. U*Grade R Maths*:

- uquka kwaye wandisa umxholo kaCAPS kwiMathematika yeBanga R ecaciswe kwiiNkalo zomXholo ezintlanu
- ikhuthaza ukufunda okusekelwe kuphando ngokucebisa ngeendlela zokwandisa umdla wendalo kubafundi ukuze baqonde ngokubangqongileyo
- ibonelela ngemisebenzi ekhuthaza abafundi ukuba baphande kwaye baphicothe iikhonsepthi zemathematika
- ikhuthaza ootitshala ukuba bathethe nabafundi ngeengcinga zabo kwaye babancede bavakalise izimvo zabo
- icebisa iindlela zokuba abafundi bacwangcise, bajonge kwaye baqokelele ulwazi, ukuze bathelekise, bahlele kwaye batolike iziphumo zabo
- ibonelela ngezixhobo ezifanelekileyo.

IiNkalo zomXholo zeMathematika

IMathematika kwiSigaba esisisiSeko (kubandakanya iBanga R) iquka iiNkalo zomXholo ezintlanu. INkalo yomXholo nganye inegalelo ekuphuhliseni ulwazi oluthile lwemathematika nezakhono. IiNkalo zomXholo zezi:

- Amanani, iiOpareyshini noLwalamano
- IiPateni, iiFanshini neAljibhra
- IsiThuba neMilo (iJiyometri)
- Umlinganiselo
- ULwazi oluQokelelweyo

Ungakwazi ukufumana okunye ngeNkalo yomXholo nganye kuCAPS nakwiCandelo 3 lesi sikhokelo (iphepha 111).

Ulwabiwo lwexesha lweeNkalo zomXholo zeMathematika

UCAPS ucebisa ukuba ixesha lokufundisa iMathematika kwiBanga R libe ngama23 eeyure ngeveki. Nangona kunjalo, uCAPS akaboneleli ngolwabiwo okanye ngolwahlulo lwexesha emalichithwe kwiNkalo

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

yomXholo nganye ngekota kwiBanga R. Ulwabiwo lweeNkalo zomXholo zeMathematika lusebenza ngeenjongo ezimbini eziphambili:

- Lunika isikhokelo kubungakanani bexesha elifunekayo ukulungisa umxholo ngokufanelekileyo kwiNkalo yomXholo ngokwaneleyo.
- Lunika isikhokelo solwabiwo ekufanele bunikwe iindawo ezahlukeneyo zekharityhulam yeMathematika yeBanga R ngexesha lohlolo.

Inkqubo ka*Grade R Maths* icebisa ulwabiwo lwexesha olusondeleyo lweeNkalo zomXholo. Oku kusekelwe koku kulandelayo:

- Zonke iiNkalo zomXholo zibaluleke ngokulinganayo nangona lisenokungafani ixesha elichithwa kwenye nenye.
- Ezinye iiNkalo zomXholo zifuna ixesha elininzi ukuphuhlisa iikhonsepthi, umz. Amanani, iiOpareyshini noLwalamano kunye neSithuba neMilo (iJiyometri).

Inkqubo ka*Grade R Maths* igxila ngqo kwiNkalo yomXholo ethile kwiveki nganye ngelixesha kuqinisekiswa kwaye kudityaniswa ulwazi olutsha. *IsiKhokelo semiSebenzi* sekota nganye sicwangcisa umxholo nenani leeveki ngokuphathelele kulwabiwo lwexesha ukuqinisekisa ukuba izihloko zeeNkalo zomXholo zikaCAPS kunye nophuhliso lweekhonsepthi eziphambili ziqukiwe. Le theyibhile ingezantsi ibonisa inani leeveki ezifunekayo kwiNkalo yoMxholo nganye kwikota nganye.

Theyibhile 1 Inani leeveki kwiNkalo yomXholo nganye kwikota nganye

Ulwabiwo lwexesha lomXholo weMathematika kwiBanga R

INkalo yomXholo	IsiHloko	Ikota 1 iiveki	Ikota 2 iiveki	Ikota 3 iiveki	Ikota 4 iiveki	Inani leeveki zizonke ngonyaka	I% yexesha lilonke
Amanani, iiOpareyshini noLwalamano	Ukubala Ukuqaphela inani Ingqiqo manani (ubudlelane) Ukusombulula iingxaki Izibalo	3	4	5	5	17	42,5
IiPateni, iiFanshini neAljibhra	Ukuchonga, ukukopa, ukwandisa nokuyila ezabo iipateni	1	1	1	1	4	10
IsiThuba neMilo (iJiyometri)	Indawo, indawo-bume nembonakalo Izinto ezinenkangeleko engu3-D neemilo ezingu2-D Ulingano-macala (isimetri)	4	3	2	2	11	27,5
Umlinganiselo	Ixesha	1				4	10
	Ubude		1				
	Ubunzima			1			
	Umthamo/ivolumu				1		
ULwazi oluQokelelweyo	Ukuqokelela, ukuhlela, ukumela kunye nokuhlalutya izinto/ulwazi	1	1	1	1	4	10
Iiveki zizonke		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).

IMathematika nenkqubo yemihla ngemihla yeBanga R

Inkqubo yemihla ngemihla

Inkqubo yemihla ngemihla yeBanga R iyithayimthebhile eneempawu zayo ezizodwa. Ayifani neethayimthebhile ezisetyenziswa kwamanye amabanga esikolweni. Ibonelela ngeemfuno zophuhliso lwabafundi ngelixesha ikwajongana neemfuno zomgaqonkqubo zikaCAPS.

Inkqubo yemihla ngemihla yeBanga R (Umfanekiso 31) iquka ulwahlulo lwexesha elifanelekileyo njengesikhokelo sootitshala. La maxesha kufuneka akwazi ukuguquguquka kwiBanga R kodwa kufuneka kubekho:

- iiyure ezi4 nemizuzu engama36 ngosuku (okanye ama23 eeyure ngeveki) zokufunda nexesha lokufundisa
- imisebenzi equka izifundo ezintathu: ULwimi lwaseKhaya (i10 leeyure ngeveki), iMathematika (isi7 seeyure ngeveki) kunye nezaKhono zoBomi (isi6 seeyure ngeveki).

Isifundo ngasinye kwezi sineshoni engqalileyo yosuku kwaye sihlanganiswe kweminye imisebenzi imini yonke. Inkqubo yemihla ngemihla kuMfanekiso 31 ibonisa ixesha lemathematika ekugxilwa kulo kwakunye namathuba azenzekelayo okufunda imathematika. Ukufunda iMathematika kwenzeka kwi:

- seshoni yeklasi yonke, apho abafundi basebenzisana njengeqela elikhulu elinye kunye notitshala
- seshoni yeqela elincinci elikhokelwa ngutitshala apho abafundi ukuya kwisibhozo besebenza notitshala
- seshoni yamaqela amancinci apho abafundi abangagqithanga kwisibhozo basebenza ngokuzimeleyo kwimisebenzi esezitafileni (iitafile zokusebenzela)
- seshoni yokuzikhethela ngokukhululekileyo apho abafundi bakhetha ngokwabo ukuba bathanda ukwenza owuphi kwimisebenzi ekhethwe yabekwa ngutitshala (ukuzikhethela).

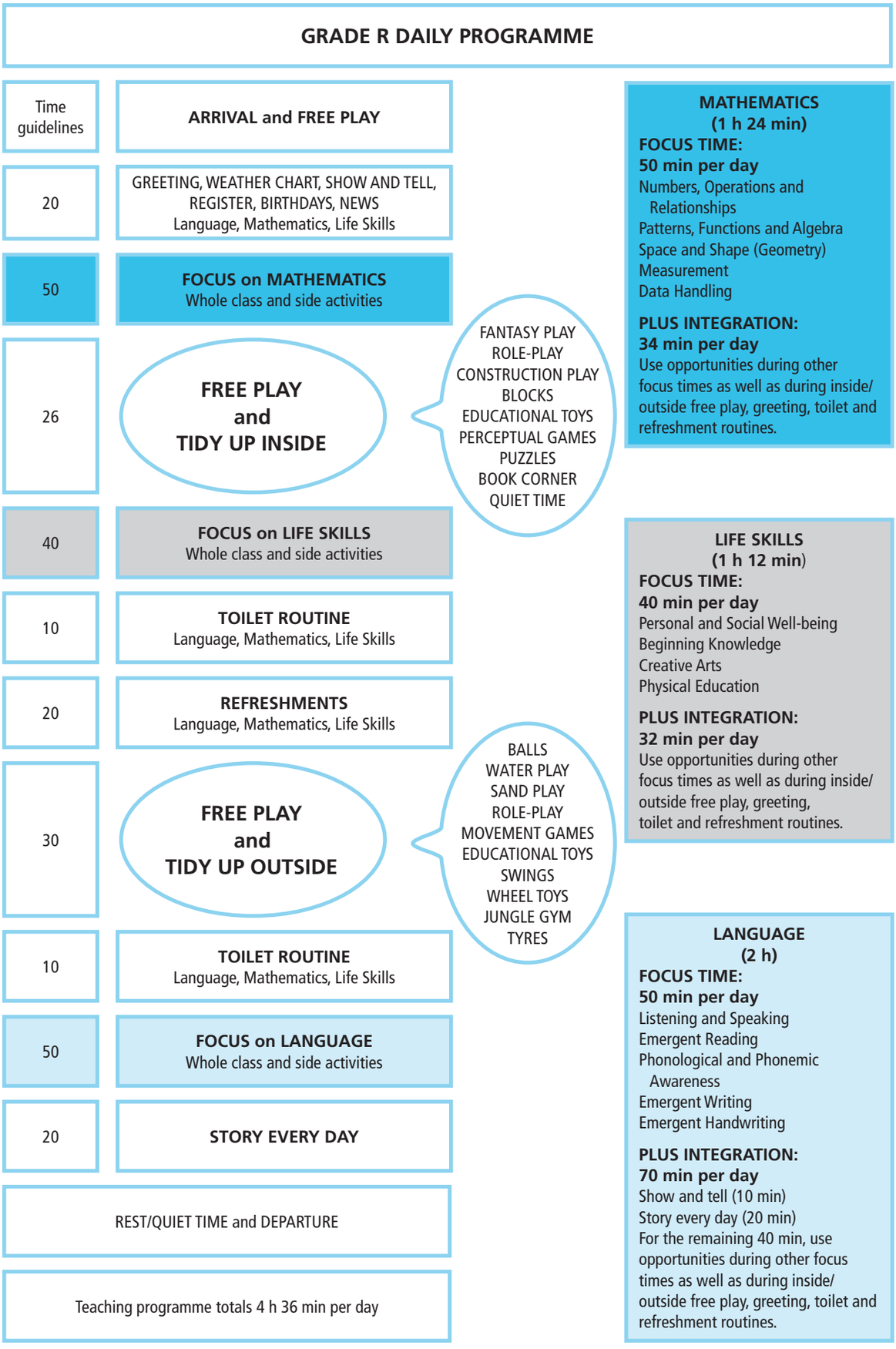


Figure 31 GDE exemplar Grade R Daily Programme

INKQUBO YEMIHLA NGEEMIHLA YEBANGA R

Izikhokelo zexesha	
	UKUFIKA kunye NOKUDLALA OKUKHULULEKILEYO
20	UKUBULISA, ITSHATI YEMOZULU, BONISA KWAYE UBALISE, IREJISTA, IMIHLA YOKUZALWA, IINDABA ULwimi, iMathematika, izaKhono zoBomi
50	**UKUGXILA kwiMATHEMATIKA** Imisebenzi yeklasi yonke kunye nesecaleni
26	**UKUDLALA OKUKHULULEKILEYO kunye NOKUQOQOSHA**
40	**UKUGXILA kwiZAKHONO ZOBOMI** Imisebenzi yeklasi yonke kunye nesecaleni
10	**IXESHA LOKUYA KUZIKHULULA** ULwimi, iMathematika, izaKhono zoBomi
20	**IXESHA LOKUTYA** ULwimi, iMathematika, izaKhono zoBomi
30	**UKUDLALA OKUKHULULEKILEYO kunye NOKUQOQOSHA NGAPHANDLE**
10	**IXESHA LOKUYA KUZIKHULULA** ULwimi, iMathematika, izaKhono zoBomi
50	**UKUGXILA kuLWIMI** Imisebenzi yeklasi yonke kunye nesecaleni
20	**IBALI YONKE IMIHLA**
IXESHA LOKUPHUMLA/UKUTHULA kunye NELOKUGODUKA	
Inkqubo yokufundisa iyonke ziiyure ezi4 nama36 emizuzu ngosuku	

UMDLALO WELIZWE LOKUZAKHELA
UMDLALO WOKULINGANISA
UMDLALO WOKWAKHA
IIBHLOKO
IITHOYIZI ZOKUFUNDISA
IMIDLALO YOKUBONWAYO
IIPHAZILE
IKONA YEENCWADI
IXESHA LOKUTHULA

IIBHOLA
UMDLALO WAMANZI
UMDLALO WESANTI
UMDLALO WOKULINGANISA
IMIDLALO YEENTSHUKUMO
IITHOYIZI ZOKUFUNDISA
OOJINGI
IITHOYIZI ZAMAVILI
INDAWO YEMITHAMBO
AMAVILI

IMATHEMATIKA
(1 iyure nama24 emizuzu)
IXESHA LOKUGXILA: ama50 emizuzu ngosuku
Amanani, iiOpareyshini noLwalamano
IiPateni, iiFanshini neAljibhra
IsiThuba neMilo (iJiyometri)
Umlinganiselo
ILwazi oluQokelelweyo

KUNYE NODITYANISO: ama34 emizuzu ngosuku
Sebenzisa amathuba ngamanye amaxesha okugxila kwakunye nexesha lomdlalo okhululekileyo wangaphakathi/ngaphandle, ukubulisa, amathuba okuya kuzikhulula kunye nexesha lokutya.

IZAKHONO NOBOMI
(1 iyure ne12 lemizuzu)
IXESHA LOKUGXILA: ama40 emizuzu ngosuku
Ubuqu kunye neNtlalontle
ULwazi lokuQala
UbuGcisa beZandla
Ezemithambo

KUNYE NODITYANISO: ama32 emizuzu ngosuku
Sebenzisa amathuba ngamanye amaxesha okugxila kwakunye nexesha lomdlalo okhululekileyo wangaphakathi/wangaphandle, ukubulisa, amathuba okuya kuzikhulula kunye nexesha lokutya.

ULWIMI
(zi2 iiyure)
IXESHA LOKUGXILA: ama50 emizuzu ngosuku
UkuMamela nokuThetha
Ukufunda okuKhulayo
IFonatiki kunye noLwazi ngeFonatiki
UkuBhala okuKhulayo
UkuBhala ngeSandla okuKhulayo

KUNYE NODITYANISO: ama70 emizuzu ngosuku
Bonisa kwaye ubalise (i10 imizuzu)
Ibali yonke imihla (ama20 emizuzu)
Kula ma40 emizuzu eshiyekileyo, sebenzisa amathuba ngamanye amaxesha okugxila kunye nawomdlalo okhululekileyo wangaphakathi/wangaphandle, elokubulisa, elokuya kuzikhulula kunye nexesha lokutya.

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.

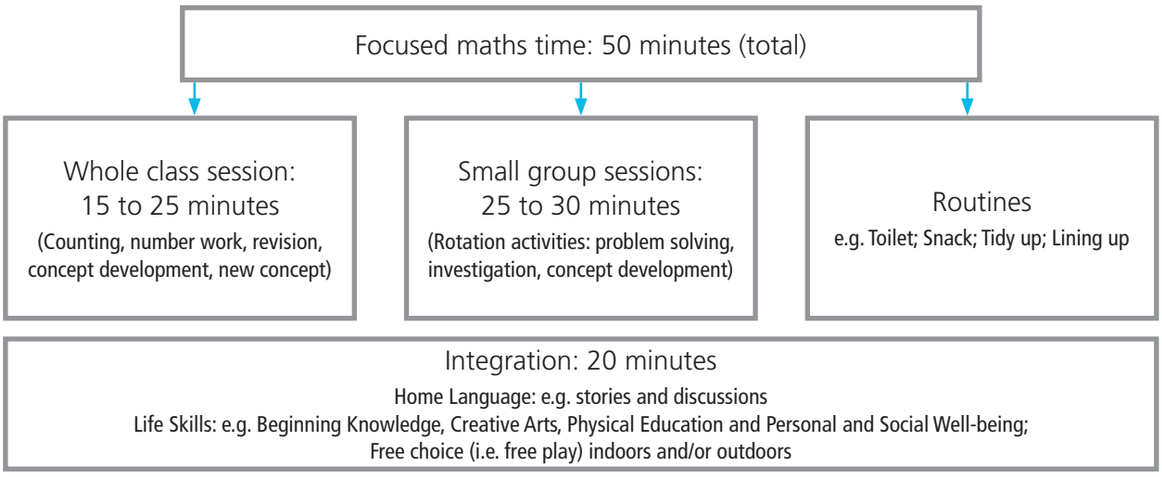


Figure 32 Suggested use of daily maths time

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

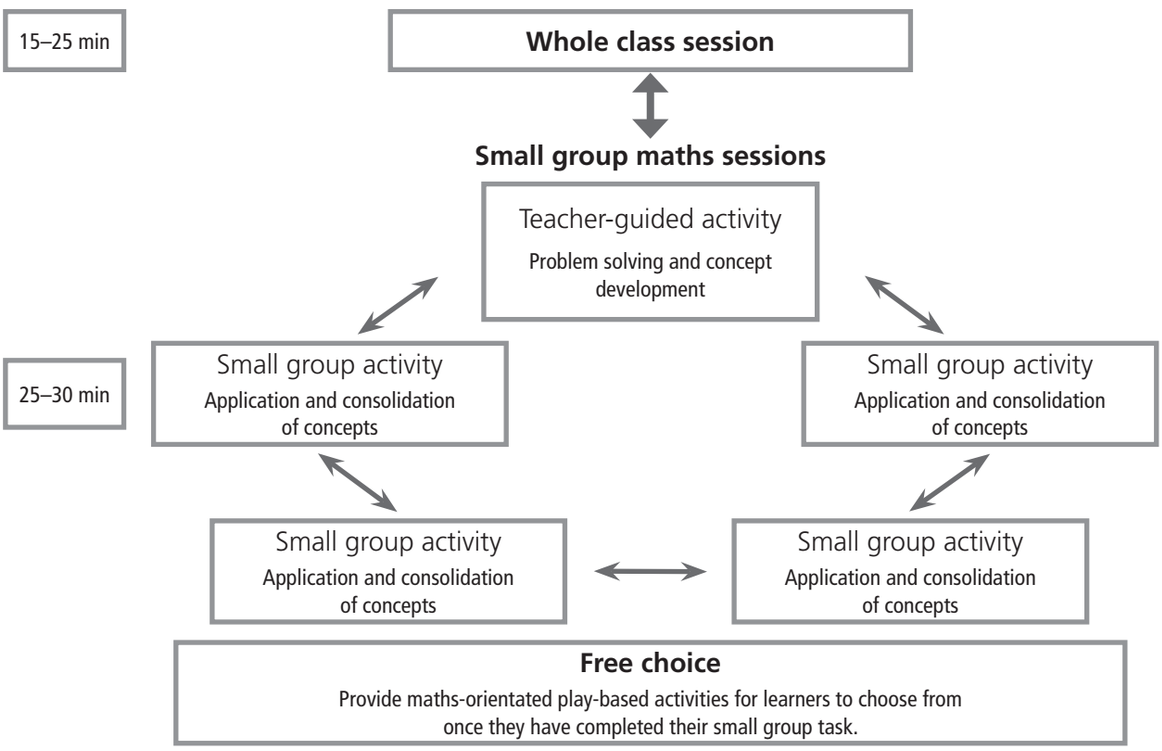


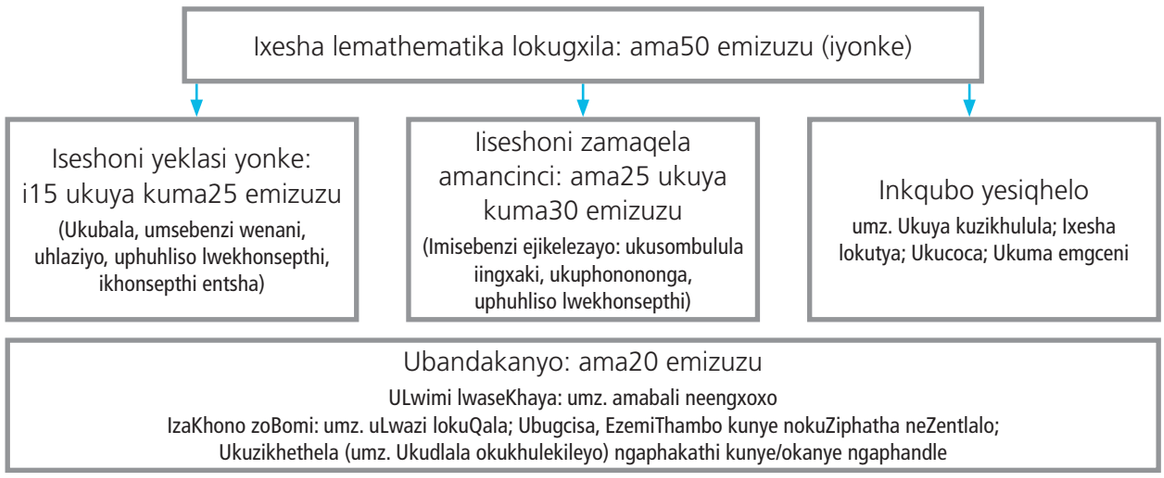
Figure 33 Daily maths focus time in Grade R Maths

Ulwabiwo lwexesha leMathematika kwiBanga R

Ixesha elisikelwe ukufundisa iMathematika kwiBanga R ziiyure ezisixhenxe ngeveki kunye neyure nama24 emizuzu (ama84 emizuzu) ngosuku. Usuku ngalunye kweli xesha lwenziwe:

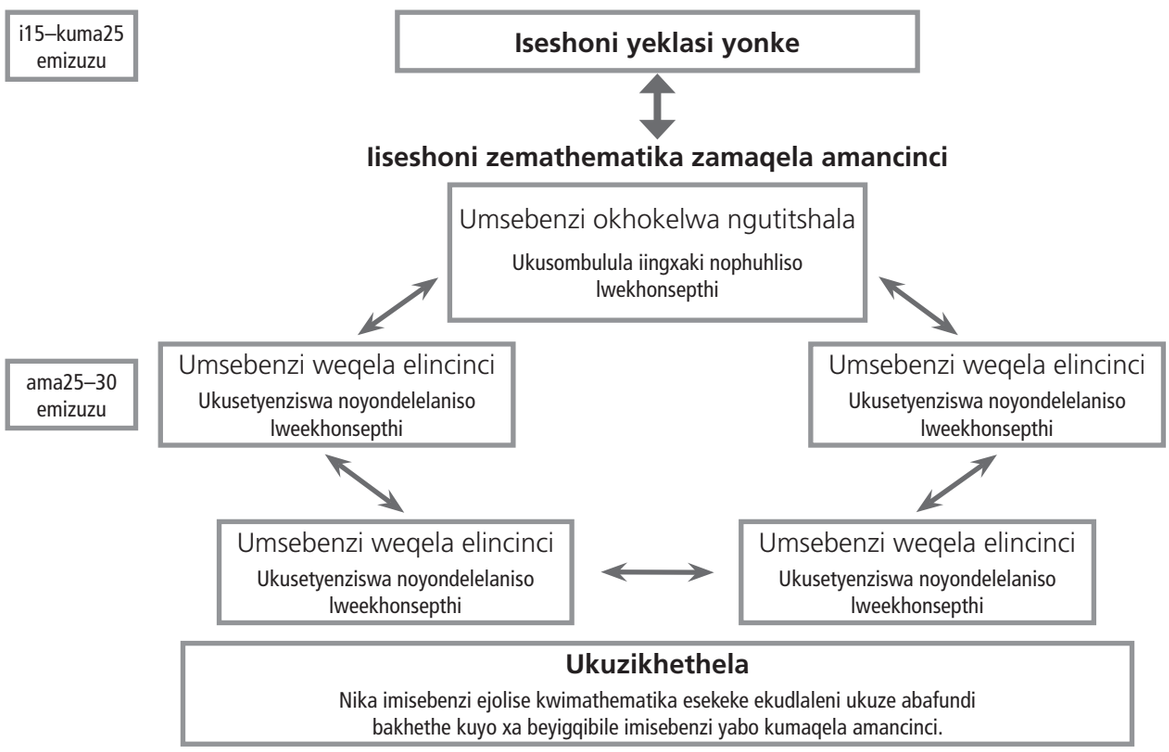
- ama50 emizuzu egxile emisebenzini yokufunda nokufundisa imathematika
- ama34 emizuzu yokufunda okudityanisiweyo, imisebenzi ecwangcisiweyo kunye nemisebenzi yabafundi ezimeleyo ngaphakathi nangaphandle kweklasi.

Umfanekiso 32 ubonakalisa ingcebiso ngendlela onokusebenzisa ngayo ulwabiwo lweyure e1 nama24 emizuzu.



Umfanekiso 32 Ingcebiso ngokusetyenziswa kwexesha lemathematika imihla ngemihla

Umfanekiso 33 ubonisa ukuba ixesha lemathematika ekugxilwe kulo licwangciswe njani ku*Grade R Maths*.



Umfanekiso 33 Ixesha lemihla ngemihla eligxile kwimathematika kwinkqubo ka*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.

Imisebenzi eyongezelelweyo enokufundiswa abafundi iquka:

- ukwakha iphazili
- imisebenzi yodongwe lokudlala
- imisebenzi yokwakha
- imidlalo efundisayo
- ikona yeencwadi – 'ukufunda'
- iincwadi kunye namaxwebhu omsebenzi weDBE.

Xa ixesha lemathematika ekugxilwe kulo liphelile, abafundi bonke bathabatha inxaxheba ekucoceni belungiselela umsebenzi olandelayo wenkqubo yemihla ngemihla.

Indlela yokucwangcisa iklasi yakho ukulungiselela iseshoni yemathematika yemihla ngemihla

Landela le migaqo ukukunceda uziqhelanise nenkqubo ka*Grade R Maths* eklasini yakho yonke imihla.

Ixesha lokugxila kwiMathematika yeBanga R kufuneka lilungiselelwe kwaye licwangciselwe indibaniselwano yemisebenzi yeklasi yonke kunye neyamaqela amancinci. Amaqela ahlukeneyo ngokomlinganiselo afezekisa iinjongo ezahlukileyo zokufundisa nokufunda. Ukukhetha iklasi yonke okanye iqela elincinci kuxhomekeka kumsebenzi wokufundisa okanye owohlolo ocwangciswe ngutitshala. Ukulawula iklasi enkulu kungumcelimngeni, ingakumbi ukuba utitshala ucwangcise ukugxila kubafundi abathile kunye nokudibanisa abafundi abanemiqobo ekufundeni.

Iiseshoni zemathematika zamaqela amancinci

Iiseshoni zemathematika zeklasi yonke ziqhele ukuthatha phakathi kwe15 nama25 emizuzu ubude kwaye bonke abafundi bahlala esangqeni kunye notitshala.

Le misebenzi yemathematika elandelayo inokwenziwa kwiiseshoni zemathematika zeklasi yonke:

- ukuhlanganisa nokuziqhelisa iikhonsepthi ezifundiswe ngaphambili
- ukwazisa ikhonsepthi entsha
- ukwandisa ikhonsepthi ekugxilwe kuyo kuloo veki
- ukubala ngokuvakalayo (izicengcelezo, iingoma, ukulandelelanisa amanani)
- imathematika yentloko (ukubuza iingxaki, imidlalo ephuhlisa ukukhumbula)
- ukunika imiyalelo yemisebenzi ekufuneka yenziwe kwimeko yeqela elincinci ngelixa wena usaxakekileyo kumsebenzi okhokelwa ngutitshala.

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.

Umfanekiso 34 Iseshoni yemathematika yeklasi yonke

Iiseshoni zemathematika zamaqela amancinci

Kwiiseshoni zamaqela amancinci, iklasi yahlulwa ibe ngamaqela amahlanu abafundi. Ngosuku ngalunye, iqela elinye lisebenza kunye notitshala (umsebenzi okhokelwa ngutitshala) ngelixa amanye amaqela amane esebenza ngokuzimeleyo kwimisebenzi yemathematika ecwangciswe ngutitshala.

Inzuzo yokucwangcisa imisebenzi yeqela elincinci elikhokelwa ngutitshala kunye nazimeleyo kukuba:

- Zimbalwa izixhobo zeqela elincinci ezifunekayo kunezeklasi yonke, umzekelo, izikere, izixhobo zokubala, iibhloko, njalonjalo.
- Umfundi ngamnye unethuba lokuphatha izixhobo.
- Ikhuthaza izakhono zobuntu, umzekelo, ukwabelana, ukunikana amathuba, ukuthetha kunye nokumamela.
- Abafundi bathabatha uxanduva ngemisebenzi yeqela, enjengokuqoqosha.
- Utitshala anganika imiyalelo nemibuzo ngokwenqanaba leqela.
- Utitshala angaqwalasela umfundi ngamnye ukuqinisekisa izakhono ezizimeleyo.

Ukusebenzisa amaqela amancinci kunika ootitshala ithuba lokwenza amaqela abafundi ngokwamanqanaba abufana ezakhono nobuchule. Ngamanye amazwi, utitshala uyakwazi ukwakha amaqela abafundi ngokwamanqanaba enkxaso abayifunayo ukuze bakwazi ukufunda kakuhle.

Kwisithuba seentsuku ezintlanu, amaqela ayajikeleza etshintshana kwimisebenzi eyahlukileyo ngosuku ngalunye. Oku kuthetha ukuba, ngeveki bonke abafundi bafumana ithuba lokugqiba **umsebenzi okhokelwa ngutitshala** neminye imisebenzi emine yeqela elincinci (**imisebezi yemathematika emihlanu eyahlukileyo**). Imisebenzi ezimeleyo emine (okanye **imisebenzi esecaleni**) kufanele ibekwe kakuhle **kwizitishi zomsebenzi** ezine klasini – nokuba kukwiitafile apho abafundi bahlala khona okanye bamileyo, okanye emethini, okanye phandle. Amaqela ajikeleza isithuba seveki, kuxhomekeka kwindlela utitshala acwangcise ngayo imisebenzi.

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.

Ukuziqhelisa ...

Iindlela zokwahlulahlula abafundi kwimathematika

Ukuqwalaselwa okuqhubekekayo kwabafundi ngexesha lemisebenzi yangaphandle kunye neyangaphakathi kuza kunika ootitshala ukuqonda ngobuchule kunye nomdla wabafundi. Oku kuqonda kuya kunceda ukwahlula abafundi ngokwamaqela ahlukeneyo. Amaqela asenokusekwa ngokobuchule okanye kuxhomekeke kwinkqubela yomfundi kwisakhono esitsha.

- Amaqela afana ngobuchule: Kula maqela, abafundi bakwinqanaba lophuhliso eliyeleleneyo. Maxa wambi kulula ukufundisa iikhonsepthi ezintsha zemathematika usebenzisa la maqela afanayo ngolwazi njengokuba abanye abafundi bafuna ixesha elongezelelweyo ukugqiba umsebenzi lo gama abanye bedinga imisebenzi enobunzima. Ngamanye amaxesha usenokufuna abafundi abanemiqobo ekufundeni ukuba basebenze nawe ukuqoshelisa iikhonsepthi ezinjengenye kwenye kunye nokubala iingqokelela, okanye usenokufuna ukwandisa abafundi abaphambili ngokubanika iingxaki zemathematika ezingumcelimngeni.
- Amaqela axubileyo ngolwazi: Kula maqela, abafundi bakumanqanaba ahlukeneyo ezakhono kunye nokuqonda iikhonsepthi. Ezi ndidi zamaqela zisebenza kakuhle ukwakha, umlinganiselo, ukwenza iipateni nokuhlela imisebenzi, kunye nemidlalo.

Nayiphi na indlela oyikhethayo ekwahluleni abafundi, amaqela akufuneki ahlale efana ixesha elide kwaye iqela ngalinye kufuneka libenesimboli yalo (umfanekiso nemilo) kunye negama.

Imisebenzi yamaqela amancinci ekhokelwa ngutitshala

Kumsebenzi okhokelwa ngutitshala, utitshala usebenza neqela elinye labafundi ngelixa amanye amaqela egqibezela imisebenzi ecwangcisiweyo kwezinye izitishi zemisebenzi ezine.

Le misebenzi ilandelayo yeyona ilungele iqela elincinci elikhokelwa ngutitshala:

- ukuqinisa nokuziqhelisa iikhonsepthi ezifundiswe ngaphambili
- ukwazisa nzulu ukuqonda ikhonsepthi entsha.

Ukuziqhelisa ...

Iingcebiso zemisebenzi yemathematika yeqela elincinci elikhokelwa ngutitshala

- Gqibezela imisebenzi egxile kwikhonsepthi yemathematika yeBanga R ecwangciswele loo veki.
- Sebenza nabafundi phantsi okanye etafileni.
- Yenza iseshoni enentsebenziswano, wena nabafundi nizibandakanye.
- Eyona nto ekugxilwa kuyo makube kukusebenzisa ukuthetha nokwenza kunye nabafundi.

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

Umfanekiso 35 Ukutshatisa izixhobo zokubala namakhadi amanani

Imisebenzi yamaqela amancinci

Le misebenzi elandelayo yeyona elungele imeko yeqela elincinci apho abafundi besebenza ngokuzimeleyo:

- ukuqinisa nokuziqhelisa iikhonsepthi ezifundiswe ngaphambili
- ukwazisa nzulu ikhonsepthi entsha ekugxilwe kuyo kulo veki
- ukuziqhelisa ikhonsepthi ekugxilwe kuyo kulo veki.

Ukuziqhelisa ...

Iingcebiso zokucwangcisa nokulawula imisebenzi yemathematika kwiqela elincinci elizimeleyo

- Abafundi abanamanqanaba ahlukileyo olwazi kufuneka bakwazi ukugqiba imisebenzi.
- Le misebenzi kufuneka ibenentsingiselo kubafundi.
- Le misebenzi kufuneka icace kwaye ibelula ngokwaneleyo ukuze abafundi bayigqibe ngaphandle kokuba bafune uncedo kutitshala.
- Ukuba abafundi basebenza ngokucothayo, phonononga izizathu. Guqula okanye uwulungelelanise umsebenzi ukuba kuyimfuneko.
- Abafundi kufuneka babenoxanduva lokugqiba imisebenzi yabo kwaye akufuneki baphazamise utitshala xa esebenza ngomsebenzi okwiqela elikhokelwa ngutitshala.
- Fundisa abafundi imithetho elula yezinto amabazenze nendlela yokuziphatha ngexesha lemisebenzi yamaqela amancinci: ukuqoqosha/ukupakisha umsebenzi wabo xa begqibile; indlela yokuziphatha xa betshintsha imisebenzi. Phinda imithetho yonke imihla bade abafundi bakwazi ukuyilandela ngokuzenzekelayo. Oku kuthatha ixesha! Yenze rhoqo. Balungise abafundi ngobunono xa befumana ubunzima kule mithetho.

Imisebenzi yokuzikhethela

Imisebenzi eyongezelelweyo kufuneka inikwe abo bafundi bagqiba kuqala umsebenzi wabo kwiqela elincinci phambi kokuphela kweseshoni yemathematika. Le misebenzi kufuneka inike ukubethelelwa komxholo

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.

wemathematika owufundisileyo. Abafundi kufuneka bakhethe umsebenzi kuleyo ibekwe ngutitshala. Le misebenzi kufuneka igxile kwimathematika, umzekelo, iphazili, ukupakisha iibhloko, ukuzoba, ukufaka imibala, ukubumba, ukuhlela iimilo okanye ukulinganisa umdlalo.

Ukujikeleza phakathi kwemisebenzi (iinguqu)

Inguqu lixesha apho abafundi basuka komnye umsebenzi baye komnye. Umzekelo, emva kokuba iseshoni yemathematika yeklasi yonke iphelile kufuneka iklasi icocwe ukulungiselela iseshoni elandelayo. Amaxesha enguqu kufuneka asetyenziswe ukuziqhelisa iMathematika, uLwimi lwaseKhaya nezaKhono zoBomi, umz. ukubala ngomlomo, iipateni kuqhwatywa.

Ootitshala abacwangcisa balawule inguqu banamathuba okuba neeklasi ezizolileyo, ezilungeleleneyo ezinabafundi abonwabileyo, abasebenzisanayo kwaye bekhululekile ngokwase mphefumlweni.

Ukuziqhelisa ...

Iingcebiso ekugxininiseni imathematika ngexesha leenguqu

- Nika abafundi isilumkiso esaneleyo phambi kokuba kutshintshwe imisebenzi, umz. 'Emva kwemizuzu emibini sizakugqibezela iseshoni'.
- Nika imiyalelo ecacileyo, umz. 'Qalani ngokubeka izinto ebenisebenza ngazo nandule ukuma ngomgca ngokuzolileyo ngasemnyango/hlala esangqeni'.
- Sebenzisa 'izinto ezinomtsalane' ezifana nokubala kuqhwatywa, iingoma zamanani nezicengcelezo, kunye neempawu zamanani (ubala usehla/unyuka).

Ukucwangcisa nokulungiselela izifundo zemathematika

Kukho malunga nama40 eeveki enyakeni. Kuza kufuneka ukuba ucwangcise uzilungiselele ngokucokisekileyo kwiveki nganye.

Kwiveki ephambi kwesifundo

- Funda izahluko ezingqameneyo kwi*Sikhokelo seeKhonsepthi* ne*Sikhokelo semiSebenzi*. Zona zicacisa umxholo neekhonsepthi eziza kufundiswa, zinika iingcebiso kwimisebenzi efanelekileyo kunye neengxoxo.
- Cwangcisa kwaye ulungise imisebenzi kwiveki ephambi kokuba ifundiswe.
- Chonga uhlolo ekugxilwa kulo. (Unakho ukufumana ulwazi olungaphezulu ngohlolo kwiphepha 99.)
- Lungisa izixhobo kunye neklasi ukulungiselela iveki.
- Ezinye izixhobo kufuneka ziqokelelwe kakuhle kwangaphambili, umz. iibhokisi zamaqanda, iiroli zemiqulu yephepha langasese, iikomityi zeyogathi, iibhotile zobisi okanye izinto zokuhlela.

Evekini

- Gxila ekuqondeni iikhonsepthi zemathematika ezifundiswa kuloo veki.
- Funda kwicandelo elingqameneyo kwi*Sikhokelo seeKhonsepthi*.
- Kusuku ngalunye, khangela ukuba unazo zonke na izixhobo ezifunekayo zemisebenzi yemini elandelayo.
- Ziqhelanise nemisebenzi kwangethuba. Ootitshala akufuneki balungiselele ngelixa abafundi belinde ukuqalisa umsebenzi.

The Grade R Maths programme resources

The Grade R Maths programme has four components.

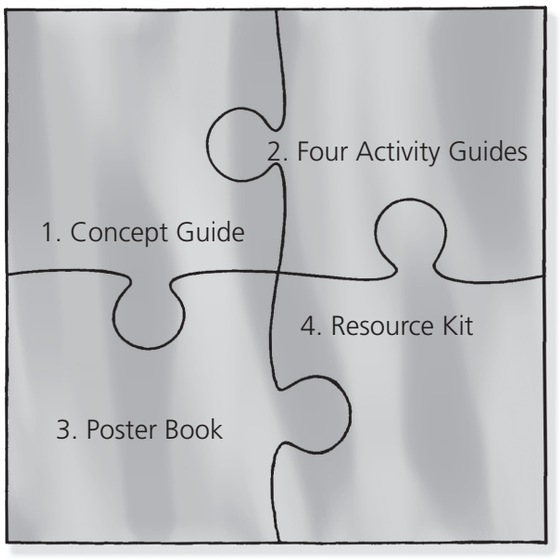


Figure 36 The components of the Grade R Maths programme

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.

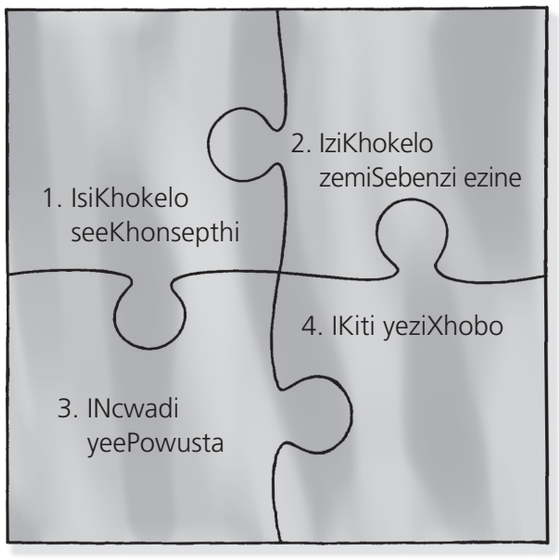
Activity Guides

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.

Izixhobo zenkqubo ka*Grade R Maths*

Inkqubo ka*Grade R Maths* ineekhomponenti ezine.



Umfanekiso 36 Iikhomponenti zenkqubo ka*Grade R Maths*

IsiKhokelo seeKhonsepthi (le ncwadi)

Le ncwadi inika:

- imigaqo esekwe kwinkqubo ka*Grade R Maths* yokufundisa imathematika kubafundi abaselula
- isikhokelo ngendlela emayicwangciswe ngayo iklasi ukulungiselela ukufundisa nokufunda okuyimpumelelo
- iingcebiso ngendlela yokufundisa imathematika kwiBanga R
- umxholo wemathematika ozakufundiswa kwinkqubo ka*Grade R Maths*
- izikhokelo ekusebenziseni u*Grade R Maths*
- uluhlu lweenkcazelo.

IziKhokelo zemiSebenzi

Kukho *iziKhokelo zemiSebenzi* ezine – esinye kwikota nganye yesikolo. *IsiKhokelo somSebenzi* ngasinye siquka:

- isishwankathelo soko kuza kwenziwa kwikota
- isihloko sekhonsepthi yemathematika ekuzakugxilwa kuso kwiveki nganye
- iingcebiso zemisebenzi yeveki nganye: eyeklasi yonke, kunye nemisebenzi yeqela elincinci elizimeleyo okanye elikhokelwa ngutitshala
- iingcebiso zokufundisa zesicwangciso nokulungelelanisa imisebenzi yemathematika
- isigama semathematika esifundwa emisebenzini kwiveki nganye
- ulwazi ngezixhobo ezizakufuneka evekini
- izixhobo ezifana nezicengcelezo, iingoma, amabali kunye neethemplethi.

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

INcwadi yeePowusta

INcwadi yeePowusta yincwadi enkulu equlethe iipowusta ezilishumi elinanye. Iipowusta zilungiselelwe ukusetyenziswa kwimisebenzi yeklasi yonke kunye nemisebenzi yeqela elincinci elikhokelwa ngutitshala. Zinceda ukunxibelelanisa imathematika kubomi bemihla ngemihla kwaye zinokusetyenziswa ngeendlela ezahlukeneyo, umz. ukubala, ukuxoxa ngendawo nesalathiso, ixesha (ukulandelelanisa iziganeko) kunye nokusombulula iingxaki.

IKiti yeziXhobo

IKiti yeziXhobo iqulethe izixhobo zokufundisa nokufunda ezibalulekileyo neziyimfuneko eziza kusetyenziswa rhoqo njengenxalenye yemisebenzi ekhokelwa ngutitshala. Le kiti ibonelela ngezixhobo ezaneleyo zeqela elincinci labafundi abathandathu ukuya kwabasibhozo. Ikiti nganye inoku kulandelayo njengoko kubonisiwe kumfanekiso wesi4 kwiphepha le13:

- izixhobo zokubala, umz. iidiski nezinti ezinemibala, iziqhamo nezilwanyana zokubala, kunye neebhloko ze*Unifix*
- idayisi elikhulu
- imitya enamaso alishumi
- amaqweqwe amanani: iisimboli zamanani (0–10) kunye namagama amanani (uziro ukuya kwishumi)
- iibhloko zeathribhyuthi
- amakhadi anamachokoza.

Ezinye izixhobo

- Amaxwebhu omgaqonkqubo kaCAPS
- Incwadi yomsebenzi weDBE kunye nezinye izixhobo

Izixhobo ezongezelelweyo (ezinganikwanga) ezidingekayo kwimisebenzi ka*Grade R Maths* ziquka:

- 'ibhokisi yepitsa'
- itshati yobude
- amakhadi amakhulu okudlala
- idayisi: elinamanani kunye neemilo
- imali yokudlala: iinkozo kunye namaphepha
- ikhalenda yalo nyaka
- iwotshi yodonga enkulu yeanalogu
- isikali
- oonopopi
- iibhloko zepateni (iibhloko zeathribhyuthi) kunye namakhadi
- ibhodi yeephegi kunye neephegi
- iingxowa zeembotyi
- iibhola ezinkulu kunye nezincinci
- amaso okubala, ukuhlela, ukuhlohla emsontweni nokwenza ipateni (kunye nemitya)
- iibhloko zokwakha neebhodi
- i*Lego*: iimilo kunye nobungakanani obohlukileyo
- iithoyizi zokwakha
- iiphazili: 8, 12, 20, 36 kunye no48 amaqhekeza
- udongwe lokubumba/intlama yokudlala
- izisiki maqebengwana

- 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.

- iikhadibhodi ezahlukileyo ngeemilo nobukhulu
- iintlobo zeebhotile zeplastiki nezikhongozeli, ukwenzela ukuchaza nokuthelekisa umthamo
- imidlalo yemathematika: i*Lotto*, i*Ludo*, iinyoka neeleli, iiphazili, iidominos (ukubandakanya umbala, imilo, amanani, ulandelelwaniso, ukutshatisa, ukwahlulahlula kunye nemidlalo yokukhumbula)
- izixhobo zokudlala ngesanti namanzi
- ukubeka iikomityi zobungakanani obahlukileyo
- izixhobo zokugwencela, zokulungelelanisa (bhalansi), zokujinga nezokuxhumaxhuma
- ivenkile yokudlala kunye nezinto eziza kuthengwa ngemali yokudlala nezixhobo zokubala nokuhlela
- iibhokisi zokugcina: ilitha ezingama40, iilitha ezi5 kunye neelitha ezi2.

Uhlolo kwiBanga R

KwiBanga R, uhlolo yinkqubo eqhubekayo, ecwangcisiweyo yokuqokelela, ukuhlalutya nokutolika ulwazi ngomfundi ngamnye. Ubukhulu becala kufuneka ibe l**uhlolo olwakhayo** nokungekho sesikweni. Ngamanye amazwi, ulwazi oluqokelelweyo ngenkqubelaphambili yomfundi ngexesha lohlolo kufuneka lukuncede ekucwangciseni nasekulungelelaniseni imisebenzi yokufunda. KwiBanga R, uhlolo lusetyenziselwa ukuthatha izigqibo ngeyona ndlela yokuxhasa uphuhliso lomfundi ngamnye.

ULUHLU LWEENKCAZELO

uhlolo olwakhayo
uhlolo olunika ingxelo ngomfundi ngelixesha ukufunda nokujonga inkqubela phambili yomfundi kuqhubeka

Uhlolo ludityaniso phakathi kwezifundo zomxholo kaCAPS, imisebenzi yokufundisa kunye neyokufunda. Awukwazi ukuhlola into ongayifundisanga. Injongo yohlolo kuku:

- qaphela inqanaba lomfundi ngamnye
- khokela isicwangciso kunye nokwazi ozakukufundisa
- khuthaza uphuhliso lwenkqubela yomfundi ngamnye
- nceda ukuvelisa iingxelo eziluncedo ngempumelelo yomfundi.

Ukuziqhelisa ...

Iingcebiso ngohlolo

- Uhlolo akufuneki lwenze abafundi bazive benexhala okanye besoyika.
- Imisebenzi yokuhlola kufuneka ifaneleke kwaye ilungele ixesha lengqalelo lomfundi ngamnye.
- Ngeli xesha uxakekile uqwalasele iqela elincinci elenziwa ngabafundi abathandathu ukuya kwisibhozo kwixesha lokugxila kumsebenzi okhokelwa ngutitshala, abanye abafundi kufuneka baxakeke besebenza ngokuzimeleyo kwimisebenzi yamaqela amancinci kwizitishi ezahlukeneyo.
- Sebenza neqela elincinci elinye labafundi abathandathu ukuya kwisibhozo kusuku ngalunye kumsebenzi othile (kuxhomekeka kwinani labafundi eklasini). Ngelixesha abafundi besenza umsebenzi, qwalasela ngononophelo umfundi ngamnye kwiqela elincinci kwaye ubuze imibuzo ukuze uqonde indlela abacinga ngayo.
- Ulwazi ngezinto abazaziyo abafundi okanye abakwazi ukuzenza (okanye 'ubungqina') kufuneka luqokelelwe ngokuqhubeka (yonke imihla) ekuhambeni kwexesha.
- Ulwazi ngoko ukuqapheleyo kufuneka lurekhodwe ekupheleni kosuku, emva kwexesha lokufundisa.

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.

Kulungile ukusebenzisa iindlela ezininzi ezahlukeneyo zokuhlola abafundi. Nantsi eminye imizekelo.

- Qwalasela abafundi ngexesha lomsembenzi weklasi yonke, imisebenzi yamaqela amancinci akhokelwa ngutitshala kunye nelokudlala ngokukhululekileyo ngaphakathi nangaphandle kweklasi.
- Rekhodisha ukuqonda kwabafundi kwiikhonsepthi ezithile zemathematika ngexesha nasemva kwemisebenzi ekhokelwa ngutitshala.
- Imibuzo kunye neengxoxo nomfundi ngamnye okanye neqela elincinci labafundi ingakunceda ukuqonda ngenqanaba kunye nobunzulu bendlela abacinga ngayo abafundi.
- Qwalasela ngononophelo kwizinto ezenziwa ngabafundi uze uzirekhodishe (usebenzisa imifanekiso, imizobo, izinto kunye/okanye 'ukubhala'). Oku kukubonisa oko kuqondwa ngabafundi nabakuzuzileyo.
- Ukumamela nokurekhodisha iimpendulo zabafundi (okwenziwayo, ngomlomo, okubhaliweyo) kukuvumela ukuba wenze uhlolo oluqhubekekayo.

Kufuneka uqhubeke nokuhlola bonke abafundi:

- kulwazi lwemathematika
- ukuqonda imathematika
- izakhono zemathematika
- iimpendulo zokusombulula iingxaki
- iindlela zokwenza izinto. (Abafundi basebenzisa iindlela zabo zokusombulula iingxaki zemathematika. Zisenokungafani nezakho iindlela, kodwa loo nto ayenzi bangazifumani ngokuchanekileyo.)

Uhlolo oluqhubekayo kubaluleke ngokukodwa ukunceda ootitshala bacwangcise imisebenzi, bakhangele inkqubela yabafundi kwaye bacwangcise nenkxaso eyongezelelweyo kubafundi abanezithintelo ekufundeni. (Ungalufumana ulwazi oluphangaleleyo ngezithintelo ekufundeni kwiphepha lama58 nelama61.)

Izixhobo zohlolo

Kwibanga R uhlolo alugxili ekunikeni amanqaku kodwa ukwazisa inkcazo eneenkcukacha kunye nokugcina umkhondo wenkqubela yomfundi. Ootitshala kufuneka basebenzise ezi zixhobo zohlolo zilandelayo.

Incwadi yokuqwalasela

KwiBanga R utitshala kufuneka aqwalasele abafundi ngaphakathi kunye nangaphandle kweklasi, ngexesha lomdlalo okhululekileyo kunye nemisebenzi eyakhiweyo. Oku kuqwalasela kuza kunika ootitshala ulwazi olubalulekileyo oluzakwazisa izicwangciso zabo kunye nokukhetha imisebenzi. Ngexesha lokugxila kwimathematika, utishala uya kusebenza neqela elincinci elinye ngosuku. Utitshala uya kuncwangcisa umsebenzi othile odityaniswe nekhonsepthi ekuCAPS. Ngelixesha abafundi bezibandakanya nalo msebenzi, utitshala uya kuqwalasela ngononophelo umfundi ngamnye kwaye abuze imibuzo ukufumana ukuqonda ngenqanaba lokucinga nelokuqonda komfundi.

Bakuba abafundi begodukile, utitshala uya kurekhodisha iziphumo zoku okanye ezinye iingqwalasela azifumene ngebhaqo. Kuluncedo ukusebenzisa incwadi enezalathiso ukohlula abafundi ngokonobumba wokuqala wegama lakhe.

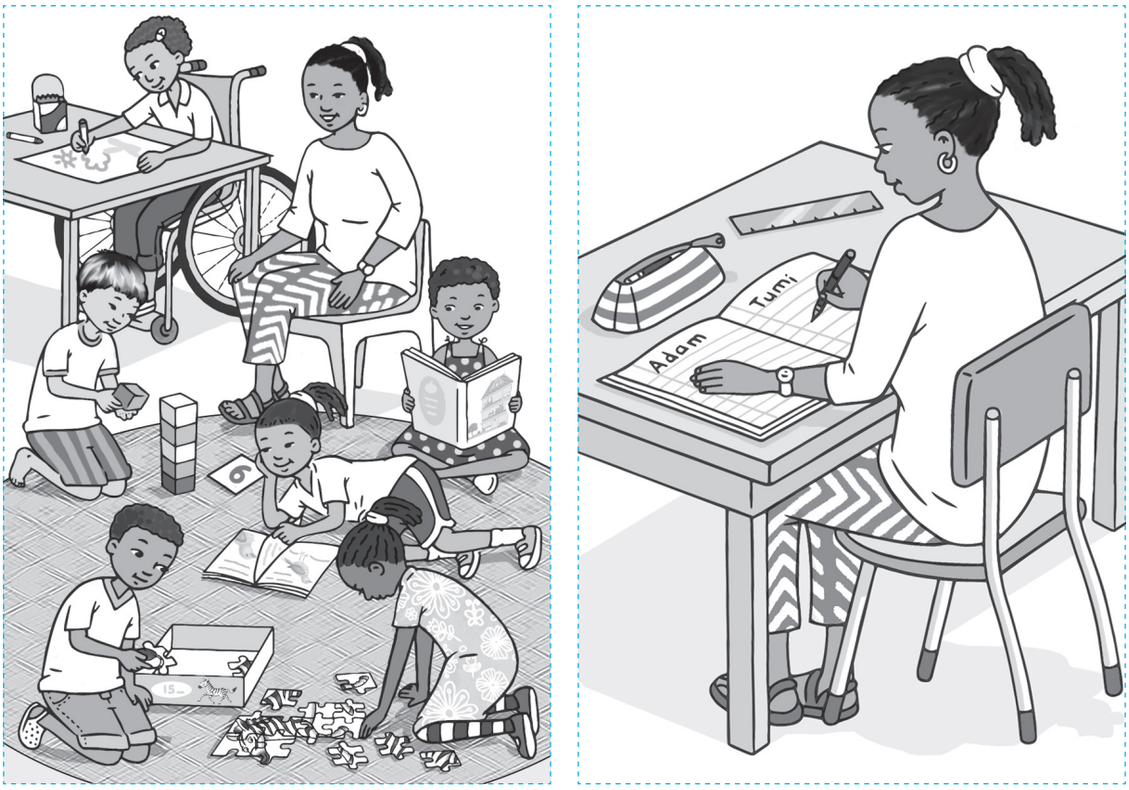


Figure 37 Observe learners then record your observations

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.

Umfanekiso 37 Qwalasela abafundi uze urekhodishe imigqaliselo

Iitsheklisti

Itsheklisti luluhlu lokuhlola lwekhrayitheriya olunika isishwankathelo sezakhono kunye nobuchule bomfundi ngamnye kwisifundo ngasinye. Ekupheleni kwe*siKhokelo semiSebenzi* ngasinye senkqubo ka*Grade R Maths* kukho itsheklisti yokuhlola yekota. Le tsheklisti inika isishwankathelo somxholo omtsha ofundisiweyo ngexesha lale kota. Utitshala angasebenzisa iisimboli ukubonisa inqanaba lempumelelo lomfundi. Umzekelo, sebenzisa uphawu lokukorekisha ukuba isakhono siphunyelelwe, sebenzisa uphawu lomnqamlezo ukuba asiphunyelelwanga, ukuze usebenzise ichaphaza ukubonisa ukuba lo mfundi akaphumelelanga ngokupheleleyo, kodwa ubonisa ukuba usekhondweni lokusiphumelela isakhono.

Umfanekiso 38 unika umzekelo wendlela ongalungiselelwa ngayo umxholo ekufuneka ukuba utitshala awurekhodishe. Amagama abafundi arekhodishwa kwikholamu yokuqala alandelwe ngumhla wokuhlola. Isimboli (✓ ✗ ●) kufuneka irekhodishwe ecaleni kwegama lomfundi ngamnye ukuhambelana nekhonsepthi okanye isakhono esidwelisiweyo kwikholamu nganye. Esi sixhobo sokuhlola siluncedo kuphela xa ootitshala benolwazi oluhle ngomfundi ngamnye, ngokusekelwe kuqwalaselo lwabo oluqhubekekayo kunye namanqaku abawarekhodishileyo kwiincwadi zabo zoqwalaselo.

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

Ikota 1: Umzekelo weRekhodi yoHlolo Oluqhubekayo

Okuphambili	AMANANI, IIOPAREYSHINI, NOLWALAMANO												IIPATENI, IIFANSHINI NEALJIBHRA					AMAGQABANTSHINTSHI	
✓ = nobuchule ● = nobuchule kancinci ✗ = akakabina buchule **Amagama abafundi**	Ubala esiya phambili ukuya kwi10	Uqikelela kwaye abale izinto 1–5	Ubala ukubuya umva 5–1	Uqaphela amanani kwiimeko eziqhelekileyo	Uqonda amanani alandelelanayo, umz. ukuma emgceni	Walatha amachaphaza/amakhadi emifanekiso 1–3	Walatha iisimboli zamanani: 1	Walatha amagama amanani: nye	Ulandelelanisa amanani: 1–3	Uqonda uhambelwano kwenye-nenye	Wahlula phakathi koninzi kunye nombalwa	Usombulula iingxaki ngezinto eziphathekayo	Usombulula iingxaki esebenzisa iminwe okanye izixhobo zokubala	Walatha iipateni kokubanggongileyo	Uqaphela 'uphindaphindo' kwiipateni	Ukhuphela iipateni esebenzisa imithambo yomzimba	Ukhuphela, aqqibezele kwaye ayile iipateni zakhe	Ucacisa ipateni yakhe (umthetho wophindaphindo)	Ikhowudi yokuqqibela
Umhla																			

Umfanekiso 38 Umzekelo wetsheklisti yohlolo

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.

Iirubriki

Irubriki sesinye isixhobo sokuhlola impumelelo yomfundi. Ikwanoluhlu lwekhrayitheriya olunenkcazelo yamanqanaba okusebenza kwesakhono esithile. Inkcazo nganye icacisa eyona nto umfundi ayenzayo okanye ayivelisayo ngexesha lomsebenzi wohlolo lwekhrayitheriya. Irubriki kufuneka inike iinkcukacha ezibhalwe ngokufanelekileyo kunye namanqanaba okusebenza ukuze zitshatiswe ngokuchanekileyo kwintsebenzo yomfundi ngamnye. Irubriki ke ivumela ootitshala ukuba babeneenjongo ngakumbi kwaye bangaguquguquki kuhlolo lwabo kwaye ikhokela isicwangciso sabo semisebenzi katitshala njengoko igqamisa amandla kunye nezithuba kulwazi lwabafundi.

Umfanekiso 39 unika umzekelo werubriki yokusombulula iingxaki zokudibanisa ukuya kwi10 ngendlela esebenzayo.

Ikhrayitheriya	**Ukunga phumeleli** [1]	**Impumelelo esisiseko** [2]	**Impumelelo esemgangathweni** [3]	**Impumelelo eyanelisayo** [4]	**Impumelelo ekwinqanaba elihle** [5]	**Impumelelo egqwesileyo** [6]	**Impumelelo esemagqabini** [7]
Usombulula iingxaxi zokudibanisa ngokwenene ukufikela kwi10.	Akakwazi kusombulula iingxaki ngokwenene.	Uyakwazi ukusombulula iingxaki ngokwenene, esebenzisa izixhobo eziphathwayo.	Uyakwazi ukusombulula iingxaki ngokwenene, kodwa akakwazi kucacisa indlela yesisombululo.	Uyakwazi ukusombulula iingxaki kwaye achaze isisombululo xa ethe wakhuthazwa.	Uyakwzi ukusombulula iingxaki ngokwenene kwaye achaze indlela yesisombululo ngokuzimeleyo.	Uyakwazi ukusombulula iingxaki ngokwenene kwaye uyakwazi ukucacisa indlela yesisombululo.	Uyakwazi ukusombulula iingxaki ngokwenene kwaye uyakwazi ukucacisa indlela yesisombululo kwaye acebise ezinye iindlela.

Umfanekiso 39 Umzekelo werubriki

Amanqanaba achazayo kwirubriki angadityaniswa neekhowudi zokurekhodisha. ISebe leMfundo esisiSeko (DBE) libonelela ngeekhowudi zokurekhodisha kunye nenkcazo yesakhono, kwaye lidibanise oku kwiipesenti (jonga kumfanekiso 40). Ngeenjongo zokunika ingxelo iikhowudi zokurekhodisha kunye nenkcazo zingaguqulelwa kwiipesenti.

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.

Ikhowudi yokureyitha	Inkcazo yesakhono	Ipesenti
7	Impumelelo esemagqabini	80–100
6	Impumelelo egqwesileyo	70–79
5	Impumelelo ekwinqanaba elihle	60–69
4	Impumelelo eyanelisayo	50–59
3	Impumelelo esemgangathweni	40–49
2	Impumelelo esisiseko	30–39
1	Ukungaphumeleli	0–29

Umfanekiso 40 Ikhowudi yokureyitha

KwiBanga R ugxilo lohlolo lusekuchazeni intsebenzo kunokuvavanya ngokweepesenti. Iingxelo ezibonelela abazali kunye nabanye ootitshala ngenkcazo etyebileyo yokuziphatha kunye noko kuveliswa ngabafundi, zixabiseke ngakumbi kuvavanyo lwentsebenzo yeepesenti. Kungcono ukuthintela iimvavanyo zokuhlola ezingalunganga nezisilelisa abafundi ngethuba kwinkqubo. Uhlolo kufuneka lusetyenziselwe ukufumana ulwazi ngenqanaba lobuchule bomfundi ukuze kulungelelaniswe isicwangciso kunye nokufundisa ukulungiselela kunye nokukhuthaza umfundi ngamnye eklasini.

Kufuneka urekhodishe uhlolo lwakho oluqapheleyo kunye nobunye ‘ubungqina’ kwijenali, okanye kwiphepha lokujonga okanye kwitsheklisti. Ngale ndlela, ebudeni bonyaka, umfanekiso opheleleyo ngomfundi ngamnye, nako konke ukomelela nobuthathaka babo, wakhiwa ngokuthe chu.

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:

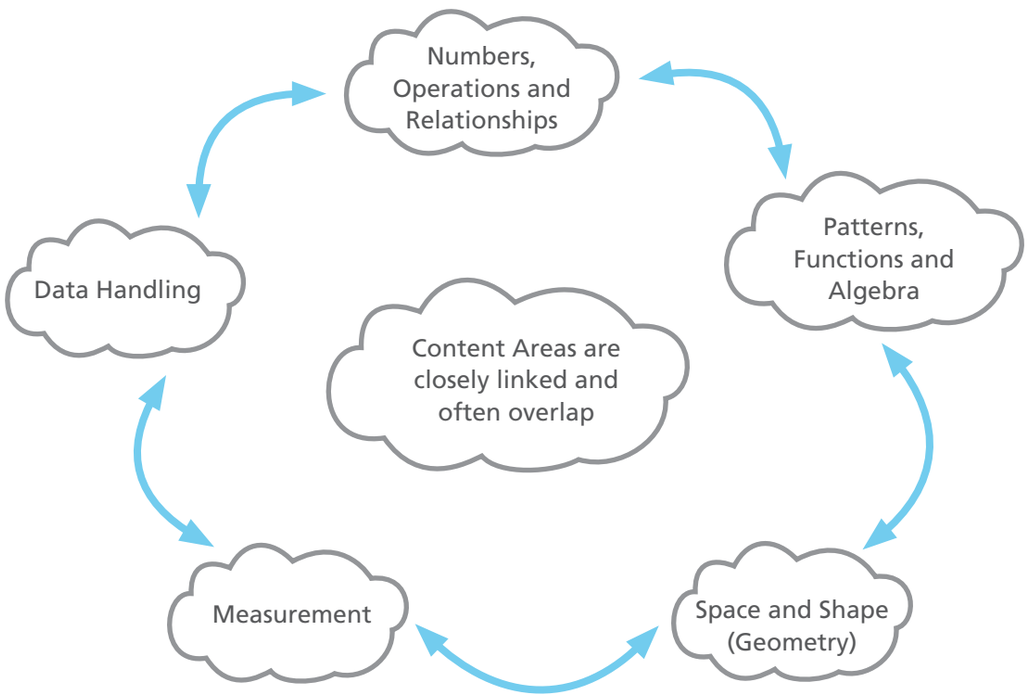


Figure 4.1 Grade R CAPS Mathematics Content Areas

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.

ICANDELO 3

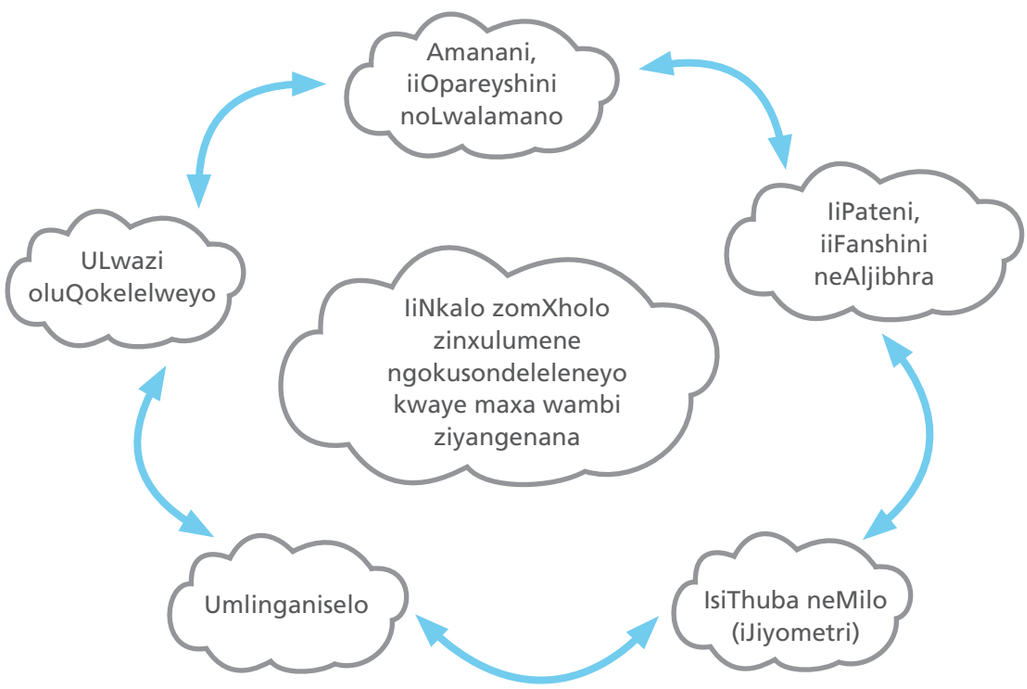
IMathematika kwiBanga R

Intshayelelo

Eli candelo le*siKhokelo seeKhonsepthi* linika isishwankathelo seeNkalo zomXholo zeMathematika kaCAPS zeBanga R kwaye:

- libonelela ngezimvo ezisebenzayo zokufunda eklasini
- licacisa iikhonsepthi zemathematika kunye nomxholo ekufuneka ootitshala bewuqondile
- liqaqambisa uphuhliso lolwazi lwemathematika kubafundi abase bancinci.

ICandelo 3 (amaphepha 114–137) linika ucazululo lomxholo weKota1–4 yeBanga R. IiNkalo zomXholo ezintlanu zikaCAPS zezi:



Umfanekiso 4.1 IiNkalo zomXholo zeBanga R zeMathematika zikaCAPS

INkalo yomXholo nganye yahlulwe ngokwezihloko. Kwisihloko ngasinye, eli candelo le*siKhokelo seeKhonsepthi* linika:

- inkcazelo yesihloko, equka ukuchonga iikhonsepthi ezithile kunye nezakhono
- iingcebiso zokufundisa kwibhokisi ethi 'Ukuziqhelisa'
- inkcazelo yesigama semathematika.

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.

Nangona iiNkalo zomXholo zibonakalisa iimeko ezithile zophuhliso lwemathematika, zinxulumene kwaye ziyahambelana ngexesha lemisebenzi. Umzekelo, xa abafundi begxile kumsebenzi womlinganiselo, baza kusebenzisa nezinye izakhono zenye iNkalo yomXholo, umzekelo, Amanani, i-Opareyshini noLwalamano, kwaye besebenzisa nolwazi lwabo lwamanani, ukubala nezakhono zokuthelekisa. Abafundi banamathuba okusebenzisa ulwazi lwabo nezakhono kwiimeko ezahlukeneyo.

Ukuziqhelisa ...

Ngelixa ootitshala begxila ngakumbi kwezi Nkalo zomXholo ngexesha eligxila kwizibalo, kufuneka bakhumbule ukusebenzisa amanye amathuba kwinkqubo yemihla ngemihla ukuba:

- basebenzise ulwimi lwemathematika ukwazisa nokubethelela iikhonsepthi
- babonise ukusetyenziswa kwesigama esiphangaleleyo esinxulumene nenani, imilo, isithuba, umlinganiselo kunye nolwazi oluqokelelweyo.

Nazi ezinye iindlela ezisebenzisekayo zokwenza oku:

- Bonelela ngezinto ezithengiweyo, ezinokuphinda zisetyenziswe nezinto zendalo ukuze abafundi bahlele, bathelekise kwaye balungelelanise.
- Bonelela ngezixhobo zokwenza umdlalo wokulinganisa, ukuthenga nokuthengisa, ubunzima nomlinganiselo.
- Ukwenza iiseti zemifanekiso ukubonisa ukulandelelana kweziganeko ngexesha lasemini kunye nemo yezulu evekini.
- Qaphela kwaye uthethe ngemilo kunye neepateni ezindleleni, kwiingcingo, kwizitiya zemifuno.
- Cwangcisa imisebenzi nemidlalo apho abafundi basebenzisa imizimba yabo nezakhono zezibalo ukulandela nokunika isalathiso.
- Ukunxulumanisa amabali kunye nomdlalo wangaphandle kwimathematika.

Umxholo weMathematika

Isishwankathelo somxholo esilandelayo sinika itheybhile yomxholo ka*Grade R Maths* omawufundiswe kunyaka weBanga R. Sibonisa umxholo omawufundiswe kwikota nganye.

- Umbhalo ozuba ngumxholo uthathwe ngqo kuCAPS weMathematika yeBanga R.
- Umbhalo oyinkcazelo nomxholo obhalwe mnyama wongeziwe ukuze wandise kwaye wakhele phezu kukaCAPS.
- Ezi zihloko zilandelelanisiwe ukubonisa ukukhula okuqhubekekayo ukusuka kwisihloko ukuya kwesinye.

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. AMANANI, IIOPAREYSHINI NOLWALAMANO					
	UMXHOLO	**IKOTA 1**	**IKOTA 2**	**IKOTA 3**	**IKOTA 4**
UKUBALA					
1.1	**Ukubala izinto (Qikelela uze ubale izinto ukuze uphucule ingqiqo ngokwamanani)**	**Uluhlu lwamanani: 1–5** Ukubala nganye: ukuhambelana kwenye nenye: amalungu omzimba kunye nezinto eziphathekayo Yazisa ngeTshathi yoncedo Yazisa ngengqikelelo yoqikelelo (intekelelo enengqiqo) Amakhadi anamachokoza: - chonga inani lamachokoza emakhadini, kwiidomino nasemadayisini (1–5) - tshatisa izinto nemifanekiso kunye namakhadi anamachokoza Bala ukuba 'zingaphi' usebenzisa iminwe, amakhadi anamachokoza, izinto ezingaphakathi nangaphandle eklasini, imifanekiso kunye neentshukumo, umz. ukuqhwaba izandla, ukungqisha ngeenyawo	**Uluhlu lwamanani: 1–7** Qikelela uze ubale Ukubala nganye: ukuhambelana kwenye nenye: amalungu omzimba kunye nezinto eziphathekayo Bethelela kwiTshathi yoncedo Amakhadi anamachokoza: - chonga inani lamachokoza emakhadini, kwiidomino nasemadayisini (1–6) - tshatisa izinto nemifanekiso kunye namakhadi anamachokoza Sebenzisa uluhlu lweemeko, izinto kunye neziganeko ukuze ubale ukuba 'zingaphi'. Iminwe, amakhadi anamachokoza, intambo enamaso alishumi, ezinye izinto ezingaphakathi nangaphandle eklasini, imifanekiso kunye neentshukumo, umz. ukuqhwaba izandla, ukungqisha ngeenyawo Bonisa u-'inye nganeno/inye ngaphezulu' Qhwaba amatyeli amaninzi/amatyeli ambalwa	**Uluhlu lwamanani: 1–10** Qikelela uze ubale Ukubala nganye: ukuhambelana kwenye nenye; bala onke: - amalungu omzimba - izinto eziphathekayo Bethelela kwiTshathi yoncedo Amakhadi anamachokoza: kwazi ukubona ingqokelela yamachokoza 1–5 ukuya ku3 ngaphezulu kumakhadi, emadayisini nakwiidomino Qalisa kwinani olinikiweyo uze 'uqhubeke ubala' utsiba-tsibakwitreki yamanani, usebenzisa intambo onamaso alishumi, amakhadi anemifanekiso, ucingo oloneke amanani Bonisa u-'inye nganeno/inye ngaphezulu; zimbini ngaphezu/zintathu nganeno' Qhwaba amatyeli amaninzi/amatyeli ambalwa: - leliphi inani oliqhwabele kaninzi/ nganeno, ninzi kakhulu/mbalwa kakhulu	**Uluhlu lwamanani: 0–10 na-ngaphaya** Qikelela uze ubale Ukubala nganye: ukuhambelana kwenye nenye; bala onke: - amalungu omzimba - izinto eziphathekayo Bethelela kwiTshathi yoncedo Amakhadi anamachokoza: kwazi ukubona ingqokelela yamachokoza 1–5 ukuya kutsho ku5 kwidayisi (1–6) nakwiidomino Qalisa kwinani olinikiweyo uze 'uqhubeke ubala' utsiba-tsiba kwitreki yamanani, usebenzisa umsonto onamaso alishumi, amakhadi anemifanekiso, ucingo oloneke amanani Bonisa u-'inye nganeno/inye ngaphezulu; zimbini ngaphezu/zintathu nganeno' Qhwaba amatyeli amaninzi/amatyeli ambalwa: - leliphi inani lokuqhwaba elininzi/ elinganeno, ninzi kakhulu/mbalwa kakhulu Intsingiselo kaziro (unothi) '0'
1.2	**Bala ukuya phambili kunye nokubuyela umva** **Ukubala ukhwaza okanye ngentloko (ucengcengceleza)**	**Ukubala usiya phambili: 1–10** **Ukubala ubuyela umva: 5–1** Ukubala ngebhaqo kusetyenziswa izicengcelezo neengoma zamanani, okwenziwa rhoqo (imihla ngemihla), iintshukumo zomzimba, njl. Bala nganye Uluhlu lwamanani: 1	**Ukubala usiya phambili: 1–15** **Ukubala ubuyela umva: 7–1** Ukubala ngebhaqo kusetyenziswa izicengcelezo neengoma zamanani, okwenziwa rhoqo (imihla ngemihla), iintshukumo zomzimba, njl. Bala nganye Uluhlu lwamanani: 1–4	**Ukubala usiya phambili: 1–20** **Ukubala ubuyela umva: 10–1** Ukubala ngebhaqo kusetyenziswa izicengcelezo neengoma zamanani, okwenziwa rhoqo (imihla ngemihla), iintshukumo zomzimba, njl. Bala nganye Uluhlu lwamanani: 1–7	**Ukubala usiya phambili: 0–20 nangaphezulu** **Ukubala ubuyela umva: 10–0** Ukubala ngebhaqo kusetyenziswa izicengcelezo neengoma zamanani, okwenziwa rhoqo (imihla ngemihla), iintshukumo zomzimba, njl. Bala: ngoo-nonye, ngoo-nombini Uluhlu lwamanani: 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

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
1.3	**Iisimboli zamanani namagama amanani** **Nakana uze uchonge iisimboli zamanani namagama amanani**	**Iisimboli zamanani: 1, 2, 3** **Amagama amanani: nye, mbini, nthathu** Mela amanani usebenzisa: - umzimba (intshukumo yomzimba) - izinto (ephathekayo) - imifanekiso, imizobo (ebubambeka) - amakhadi anamachokoza (izinto ezi bubambeka) Tshatisa nesimboli yenani (enxaxhileyo) kunye negama lenani Isimboli yenani: 1 Igama lenani: nye	**Iisimboli zamanani: 4 no 5** **Amagama amanani: ne, ntlanu** Mela amanani usebenzisa: - umzimba (intshukumo yomzimba) - izinto (ephathekayo) - imifanekiso, imizobo (ebubambeka) - amakhadi anamachokoza (ebubambeka) Tshatisa nesimboli yenani (enxaxhileyo) kunye negama lenani Bethelela: 1, 2, 3 Bethelela: nye, mbini, ntathu Isimboli yenani: 2, 3, 4 Igama lenani: mbini, ntathu, ne	**Iisimboli zamanani: 6, 7, 8** **Amagama amanani: ntandathu, sixhenxe, sibhozo** Mela amanani usebenzisa: - umzimba (intshukumo yomzimba) - izinto (ephathekayo) - imifanekiso, imizobo (ebubambeka) - amakhadi anamachokoza (ebubambeka) Tshatisa nesimboli yenani (enxaxhileyo) kunye negama lenani Bethelela: 1, 2, 3, 4, 5 Bethelela: nye, mbini, ntathu, ne, ntlanu Isimboli yenani: 5, 6, 7 Igama lenani: ntlanu, ntandathu, sixhenxe	Isimboli yenani: 0 ukuya ku 10 Igama lenani: ziro (nothi), sibhozo, lithoba, lishumi Mela amanani usebenzisa: - umzimba (intshukumo yomzimba) - izinto (ephathekayo) - imifanekiso, imizobo (ebubambeka) - amakhadi anamachokoza (ebubambeka) Tshatisa nesimboli yenani (enxaxhileyo) kunye negama lenani Bethelela onke amanani
UKUNAKANA AMANANI					
1.4	**Sebenzisa amanani kwiimeko zesiqhelo**	Sebenzisa amanani kwiimeko zesiqhelo: - iminyaka - amanani akwimifanekiso kunye nakumakhadi anamachokoza - imidlalo yamakhadi amanani - irejista yobukho	Sebenzisa amanani kwiimeko zesiqhelo: - idilesi - amanani akwimifanekiso kunye nakumakhadi anamachokoza - imidlalo yamakhadi amanani - amanani akwiintengiso/ kumaphepha ezibhengezo/ kumakhadi osuku lokuzalwa - irejista yobukho	Sebenzisa amanani kwiimeko zesiqhelo: - idilesi, iinombolo zoqhakamshelwano - usuku lokuzalwa - amanani akwimifanekiso kunye nakumakhadi anamachokoza - imidlalo yamakhadi amanani - amanani akwiintengiso/ nakumaphepha ezibhengezo/ nakumakhadi osuku lokuzalwa - irejista yobukho	Sebenzisa amanani kwiimeko zesiqhelo: - idilesi, iinombolo zoqhakamshelwano - amanani akwimifanekiso kunye nakumakhadi anamachokoza - imidlalo yamakhadi amanani - amanani akwiintengiso/ nakumaphepha ezibhengezo/ nakumakhadi osuku lokuzalwa - irejista yobukho
INGQIQO YAMANANI (UBUDLELANE) **Chaza, uthelekise uze ulandelelanise amanani**					
1.4	**Chaza amanani apheleleyo/ azeleyo**	**Uluhlu lwamanani: 1–3** Chonga uze uchaze amanani apheleleyo ukuya ku1, 2, 3 usebenzisa iingqokelela kunye neesimboli (nye ngaphezulu, nye nganeno kuno-; ngaphambi, emva, phakathi) Uluhlu lwamanani: 1	**Uluhlu lwamanani: 1–5** Chonga uze uchaze amanani apheleleyo 4, 5 usebenzisa iingqokelela kunye neesimboli Bethelela amanani 1–3	**Uluhlu lwamanani: 1–8** Chonga uze uchaze amanani apheleleyo 6, 7, 8 usebenzisa iingqokelela kunye neesimboli Bethelela amanani 1–5 Uluhlu lwamanani: 1–7	**Uluhlu lwamanani: 0–10** Chonga uze uchaze amanani apheleleyo 0, 9, 10 Bethelela amanani 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

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
	Thelekisa amanani	Thelekisa ukuba kwezi ngqokelela zimbini yeyiphi: - enkulu, encinci - enkulwana, encinane - eyona inkulu, eyona incinci Ukubeka ngaphezulu ngesibini seengqokelela zezinto ezinikiweyo ukususela kweyona incinci ukuya kweyona inkulu kunye nokususela kweyona inkulu ukuya kweyona incinci Ninzi no-mbalwa, umz. ukuqhwaba ngebhaqo, ixesha lokutya/ lamashwamshwam, ukwabela ngezixhobo	Thelekisa ukuba kwezi ngqokelela zimbini yeyiphi: - enkulu, encinci - enkulwana, encinane - eyona inkulu, eyona incinci Ngentla kuno-, nganeno kuno-, lingana ne- Ninzi no-mbalwa, umz. ukuqhwaba ngebhaqo	Ngentla kuno-, nganeno kuno-, lingana ne- Ninzi no-mbalwa Buza imibuzo ethi: ‘Yeyiphi eyayinezininzi kakhulu/ezimbalwa kakhulu?’	Ngentla kuno-, nganeno kuno-, lingana ne- Ninzi no-mbalwa Buza imibuzo ethi: ‘Yeyiphi eyayinezininzi kakhulu/ezimbalwa kakhulu?’
			Yenza amaqela alinganayo (iiseti) ezinto, umz. abantwana okanye izinto eziseklasini	Ukusebenzisa izinto ukuze wenze amaqela alinganayo (iiseti)	Ukusebenzisa izinto ukuze wenze amaqela alinganayo (iiseti)
		Ukucazulula nokudibanisa iingqokelela zika2 no3, umz. 3 usenokuba: ngu1 no1 kunye no1 OKANYE 2 no1 OKANYE 1 no2 OKANYE uziro no3	Ukucazulula nokudibanisa iingqokelela zika 4 no5, umz. 4 usenokuba: ngu1 no1 no1 kunye no1 OKANYE 3 no1 OKANYE 2 no2 OKANYE uziro no4	Sebenzisa izincedisi ukuhlola nokuphanda uze wenze iindlela zokucazulula nokudibanisa iingqokelela eziya kutsho ku8	Sebenzisa izincedisi ukuhlola nokuphanda uze wenze iindlela zokucazulula nokudibanisa iingqokelela eziya kutsho ku10
	Cwangcisa (ulandelelwaniso) amanani	Ukubeka ngaphezulu ngesibini seengqokelela zezinto ezinikiweyo ukususela kweyona incinci ukuya kweyona inkulu kunye nokususela kweyona inkulu ukuya kweyona incinci	Ukubeka ngaphezulu ngesibini seengqokelela zezinto ezinikiweyo ukususela kweyona incinci ukuya kweyona inkulu kunye nokususela kweyona inkulu ukuya kweyona incinci	Ukubeka ngaphezulu ngesibini seengqokelela zezinto ezinikiweyo ukususela kweyona incinci ukuya kweyona inkulu kunye nokususela kweyona inkulu ukuya kweyona incinci	Ukubeka ngaphezulu ngesibini seengqokelela zezinto ezinikiweyo ukususela kweyona incinci ukuya kweyona inkulu kunye nokususela kweyona inkulu ukuya kweyona incinci Matanisa ikhadi lesimboli yenani neengqokelela
		Ukucwangcisa ngebhaqo amanani ‘Yintoni elandelayo, eza emva kwe-, phakathi’: - inani/ucingo lokoneka - itreki okanye ileli yamanani - amakhadi amanani	Beka iisimboli zamanani zilandelelane ngendlela echanekileyo yokubala ‘Yintoni elandelayo, eza emva kwe-, phakathi’: - inani/ucingo lokoneka - itreki okanye ileli yamanani - amakhadi amanani	Beka iisimboli zamanani zilandelelane ngendlela echanekileyo yokubala ‘Yintoni elandelayo, eza emva kwe-, phakathi’: - inani/ucingo lokoneka - itreki okanye ileli yamanani - amakhadi amanani	Ngebhaqo: Uluhlu lwamanani: 0–10 Beka iisimboli zamanani zilandelelane ngendlela echanekileyo yokubala ‘Yintoni elandelayo, eza emva kwe-, phakathi’: - inani/ucingo lokoneka - itreki okanye ileli yamanani - amakhadi amanani

	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			

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
	Uluhlu lwamanani	Khulisa ngebhaqo ulwazi luka-yokuqala, yesibini, yesithathu … yokugqibela, elandelayo Inokwenziwa ngexesha: - lokutya/ixesha lokushwamza okanye elokuya ngasese - kwiimeko zemihla ngemihla, kwiinkalo zonke, xa bema emgceni, umz.'Ibingubani owokuqala/ owokugqibela/ owesibini, ukungena'	Khulisa kancinci ulwazi luka-yokuqala, yesibini, yesithathu, yesine, yokugqibela, elandelayo Kwiimeko zemihla ngemihla: okwenziwa rhoqo (imihla ngemihla) – ukuma emgceni, ixesha kutya, elokuya ngasese Yondelelanisa: Izakhono zoBomi, ezokukhula ngokwasemzimbeni kunye nemisebenzi yobugcisa (apho kufanelekileyo), imisebenzi yangaphandle, umz. imidyarho Dwelisa izinto okanye izincedisi uze uxoxe nendawo ezikuyo	Khulisa kancinci ulwazi luka-yokuqala, yesibini, yesithathu, yesine, yokugqibela, elandelayo Bethelela amanani olandelelwano koko okwenziwa rhoqo (imihla ngemihla) uze ukuyondelelanise emini kunye nakwimisebenzisi yangaphandle, umz. umdyarho Beka abafundi nezinto emgceni uze wolathe iindawo zolandelelwano eziya calanye, umz. ukususka ekhohlo ukuya ekunene	Khulisa kancinci ulwazi luka-yokuqala, yesibini, yesithathu, yesine, yesihlanu, yesithandathu, yokugqibela, elandelayo Bethelela amanani olandelelwano koko okwenziwa rhoqo (imihla ngemihla) uze ukuyondelelanise emini kunye nakwimisebenzisi yangaphandle, umz. umdyarho Beka abafundi nezinto emgceni uze wolathe iindawo zolandelelwano eziya macala omabini, umz. ukususka ekhohlo ukuya ekunene nokusuka ekunene ukuya ekhohlo
1.5	**Ixabiso lendawo**	Akukho mxholo kaCAPS kwiBanga R (gxila kwingqikelelo yamanani 1–9 kunye noziro, 1.1 no1.4)			
SOMBULULA IINGXAKI NGOKWEMEKO LEYO					
1.6	**Iindlela zokusombulula iingxaki**	**Uluhlu lwamanani: 1–3** Ukusombulula iingxaki kwiimeko zemihla ngemihla Sebenzisa ezi ndlela zilandelayo: - izixhobo eziphathekayo, umz. izixhobo zokubala - ukubala konke ngoononye	**Uluhlu lwamanani: 1–5** Ukusombulula iingxaki kwiimeko zemihla ngemihla Sebenzisa ezi ndlela zilandelayo: - izixhobo eziphathekayo, umz. izixhobo zokubala - ileli yamanani ebambekayo - amaso okwakha abe lishumi - ukubala konke ngoononye Uluhlu lwamanani: 1–4	**Uluhlu lwamanani: 1–8** Ukusombulula iingxaki kwiimeko zemihla ngemihla Sebenzisa ezi ndlela zilandelayo: - izixhobo eziphathekayo, umz. izixhobo zokubala - ileli yamanani ebambekayo - amaso okwakha abe lishumi - ukubala konke ngoononye - ukuqhubeka ubala Uluhlu lwamanani: 1–7	**Uluhlu lwamanani: 0–10** Ukusombulula iingxaki kwiimeko zemihla ngemihla Sebenzisa ezi ndlela zilandelayo: - izixhobo eziphathekayo, umz. izixhobo zokubala - ileli yamanani ebambekayo - amaso okwakha abe lishumi - ukubala konke ngoononye - ukuqhubeka ubala Uluhlu lwamanani: 0–10
1.7	**Ukudibanisa nokuthabatha** Sombulula iingxaki zamagama (iisam ezingamabali) uze ucacise ezakho izisombululo zezi ngxaki ngokudibanisa nokuthabatha ngeempendulo eziya kutsho ku10	Phanda ngokudibanisa nokuthabatha kwimisebenzi yemihla ngemihla ngokusebenzisa izixhobo zokuncedisa kunye namabali Thetha ngokuvakalayo usombulule iingxaki eziquka amanani 1–3 usebenzisa izixhobo zokubala, amabali, imifanekiso	Ukusombulula iingxaki eziquka amanani 1–5 usebenzisa izinto, amabali, imifanekiso Sebenzisa izixhobo zokubala uze uthethe usombulula iingxaki eziquka amanani 2, 3 no4 Bethelela ekusombululeni iingxaki eziquka amanani 1 ukuya ku4	Ukusombulula iingxaki eziquka amanani 1–8 usebenzisa izinto, amabali, imifanekiso Yazisa isigama (yongeza ku-/dibanisa/ thatha ku-/thabatha) Sebenzisa izixhobo zokubala uze uthethe usombulula iingxaki eziquka amanani 5, 6 no7 Bethelela ekusombululeni iingxaki eziquka amanani 1 ukuya ku7	Ukusombulula Izibalo zomlomo iingxaki eziquka amanani 0–10 usebenzisa izinto, amabali nemifanekiso Sebenzisa isigama (dibanisa nothabatha) Sebenzisa izixhobo zokubala uze uthethe usombulula iingxaki eziquka amanani 8, 9 no10 Bethelela ekusombululeni iingxaki eziquka amanani 1 ukuya ku10
1.8	**Ukudibanisa okuphindiweyo okukhokelela kuphindaphindo**	Akukho mxholo kaCAPS kwiBanga 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)			

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
1.9	**Ukubeka ngokwamaqela nokwabelana okukhokelela kulwahlulo (ukwabelana ngokulinganayo kunye nokubeka ngokwamaqela ngamani apheleleyo ukuya kutsho ku10 ngeempendulo eziquka intsalela)**	Yazisa ingqikelelo yokwabelana ngokulinganayo: - ngexesha lokwenziwa kwemisebenzi yemihla ngemihla - amabali nemifanekiso - ukwabelana omnye nomnye	Ukwabelana ngokulinganayo: - ngexesha lokwenziwa kwemisebenzi yemihla ngemihla - amabali nemifanekiso - ukwabelana omnye nomnye	Ukwabelana ngokulinganayo: - ukubeka ngokwamaqela - isiqingatha nokuphinda kabini - usebenzise izinto eziphathekayo	Ukwabelana ngokulinganayo: - ukubeka ngokwamaqela - isiqingatha nokuphinda kabini - usebenzise izinto eziphathekayo
1.10	**Ukwabelana okukhokelela kumaqhekeza**	Akukho mxholo kaCAPS kwiBanga R (gxila ekusombululeniiingxaki ngeentsalela ekunokwabelana ngazo, 1.9)			
1.11	**Imali**		Fundisa ngemali yaseMzantsi Afrika eziinkozo: 10c, 20c, 50c, R1, R2, R5 Chonga imibala nezilwanyana Chonga ukufana nokwahluka Hlela imali yokudlala ngokwemibala nobungakanani Beka imali yokudlala kwiikona zendlu	Fundisa ngemali yaseMzantsi Afrika engamaphepha: R10, R20, R50, R100, R200 Yolatha ukufana nokwahluka kwemali engamaphepha Hlela imali yokudlala ngokwemibala nobungakanani Beka imali yokudlala kwiikona zendlu	Beka imali yokudlala kwiikona zendlu
UBALO OLUNGAXHOMEKEKANGA KWIIMEKO: UKUSEBENZISA					
1.12	**Iindlela**	Akukho mxholo kaCAPS kwiBanga R (gxila ekubaleni zonke uze ukuqhubeke ubala, 1.1 no1.6)			
1.13	**Ukudibanisa nokuthabatha: ukusombulula ngokuthetha iingxaki ezichaziweyo zokudibanisa nokuthabatha**		Uluhlu lwamanani: 1–5 Ukusombulula ngokuthetha iingxaki zokudibanisa nokuthabatha ngeempendulo eziya kutsho ku5 Uluhlu lwamanani: 1–4	Uluhlu lwamanani: 1–8 Ukusombulula ngokuthetha iingxaki zokudibanisa nokuthabatha ngeempendulo eziya kutsho ku8 Uluhlu lwamanani: 1–7	Uluhlu lwamanani: 1–10 Ukusombulula ngokuthetha iingxaki zokudibanisa nokuthabatha ngeempendulo eziya kutsho ku10 Uluhlu lwamanani: 1–10
1.14	**Ukudibanisa okuphindiweyo okukhokelela kuphindaphindo**	Akukho mxholo kaCAPS kwiBanga R			
1.15	**Ukwahlula**	Akukho mxholo kaCAPS kwiBanga R (gxila ekwabelananeni ngokulinganayo, 1.9)			
1.16	**Izibalo ngentloko**	Qalisa umsebenzi ngamnye weklasi yonke nokhokelwa ngutitshala ngezibalo zentloko nalapho kuvela khona amathuba okufunda ngebhaqo (kokuzenzekela) Ukubala zonke izinto Ukubala usiya phambili nokubuyela umva Ukubala ngokulandelelana Ukuqikelela Ukusombulula iingxaki Imidlalo yokukhumbula			
1.17	**Amaqhekeza**	Akukho mxholo kaCAPS kwiBanga R (gxila ekwabelaneni ngokulinganayo, 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. IIPATENI, IIFANSHINI NEALJIBHRA					
	UMXHOLO	**IKOTA 1**	**IKOTA 2**	**IKOTA 3**	**IKOTA 4**
2.1 IIPATENI ZEJIYOMETRI					
Chonga iipateni		Chonga iipateni ezikwiimeko zesiqhelo zemihla ngemihla, umz. iimpahla, izinto nobume bemeko yendawo Nakana 'ukuphinda' kwiipateni			
Khuphela uze wongeze iipateni ezilula eziziphindayo ngokusebenzisa izinto ephathekayo kunye nemizobo		Khuphela uze ugqibezele iipateni Khuphela iipateni usebenzisa umzimba Khuphela, ugqibezele uze wenze ezakho iipateni Thetha ngolwimi: Yintoni elandelayo? Yintoni eza kuqala? Zifana njani? Zahluke njani?	Khuphela uze wongeze iipateni ngemifanekiso Khuphela ipateni oyinikiweyo usebenzisa iinkozo zemali Chaza iipateni eziziphindayo Kopa ipateni ekhoyo usebenzisa izinto eziphathezayo kunye neemilo, iinkozo zemali, amaso, njl.	Khuphela uze wongeze iipateni ngemifanekiso Khuphela iipateni ezime nkqo nezixwesileyo usebenzisa izinto eziphathekayo Yongeza iipateni ezilula eziziphindayo	Khuphela uze wongeze iipateni ngemifanekiso Khuphela ipateni yengxolo (okuvakalayo endlebeni) Sebenzisa izinto eziphathekayo uze uzobe iipateni
Wenza ezakhe iipateni eziziphindayo		Wenza ezakhe iipateni ezinemifanekiso izinto ezibambekayo, imizobo, iipateni zejiyometri Cacisa ipateni yakhe (umthetho wokuziphinda): - umbala omnye, iimilo ezimbini - imilo enye, imibala emibini	Wenza ezakhe iipateni ezinemifanekiso Cacisa iipateni zakhe (umthetho wokuziphinda): - imibala emibini, iimilo ezimbini - iimilo ezimbini, imibala emibini	Wenza ezakhe iipateni ezinemifanekiso Cacisa iipateni zakhe (umthetho wokuziphinda): - imibala emithathu/ emine, imilo eyahlukileyo, njl.	Wenza ezakhe iipateni ezinemifanekiso Cacisa iipateni zakhe (umthetho wokuziphinda): - imibala emithathu/ emine, imilo eyahlukileyo, njl.
2.1	**Iipateni zamanani**	Akukho mxholo kaCAPS kwiBanga R (gxila ekubaleni: ukulandelelanisa amanani nganye nangambini, 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. ISITHUBA NEMILO (IJIYOMETRI)					
	UMXHOLO	**IKOTA 1**	**IKOTA 2**	**IKOTA 3**	**IKOTA 4**
3.1	**Indawo-bume, ukufumana indawo nembonakalo** Uchaza into enye engu3-D ngokoyamene nenye (umz. ngaphambi kwe- kunye no-ngasemva kwe-)	Ubudlelane ngokwesithuba Indawo akuyo umntwana ngokuphathelele kokumngqongileyo Indawo ezikuyo izinto ezimbini okanye ngaphezulu ngokuphathelele kumfundi: - ngaphambi kwe- kunye no mgasemva kwe- - phezu, phezu kwe-, ngaphantsi, ngezantsi kwe- - phakathi no-phandle, ngaphakathi no-ngaphandle - phezulu no-ezantsi - ecaleni kwe no-phakathi kwe-	Ubudlelane ngokwesithuba Indawo akuyo umntwana ngokuphathelele kokumngqongileyo Indawo ezikuyo izinto ezimbini okanye ngaphezulu ngokuphathelele kumfundi: - phezu naphantsi - phezu kwe kunye nongaphantsi - ngaphambi kwe- nongasemva kwe-	Ubudlelane ngokwesithuba Indawo ezikuyo izinto ezimbini okanye ngaphezulu ngokuphathelelekwenye nenye kunye nakwenye nenye: - ngaphambi kwe- kunye no mgasemva kwe- - phezu, phezu kwe-, ngezantsi, no-ngezantsi - ecaleni kwe- - phakathi - ekhohlo no-kunene - umsebenzi webhodi yephegi Cacisa izinto ukususela kwiinkalo ezahlukileyo, umz. unodoli, indlu xa uyivele ngaphambili, ngasemva, ecaleni ngokuxhomekeke ekubeni umi ndawoni na	Ubudlelane ngokwesithuba Indawo ezikuyo izinto ezimbini okanye ngaphezulu ngokuphathelele kumfundi kwanangokuphathelele kwenye nenye: - ngaphambi kwe- kunye no mgasemva kwe- - phezu kwe-, phantsi kwe-, phezu kwe-, ngaphantsi - phezulu no-phantsi - ecaleni kwe, phakathi kwe- no-phakathi - ekhohlo no-kunene Indawo ezikuyo izinto ezimbini okanye ngaphezulu ngokuphathelelekwenye nenye
	Landela izalathiso (ngamnye kunye/ okanye njengelungu leqela) ukususa/ ukubeka kwisithuba esithile (icala ekuyiwa ngakulo)	Icala ekuyiwa ngakulo – ukuya phambili nokubuyela umva Phezulu naphantsi Imidlalo efana nokulandelelela itreyni/uloliwe Umzila wemiqobo – ukulandela isikhokelo Imfundo Ngemizimba nomculo	Icala ekuyiwa ngakulo – ukuya phambili nokubuyela umva Umzila wemiqobo – ukulandela isikhokelo Imisebenzi eyenziwa ngaphandle Ngebhaqo: ekhohlo nasekunene	Ukuya phambili nokubuyela umva Itshathi yeentolo Ekhohlo nasekunene	Ukuya phambili nokubuyela umva Phezulu naphantsi Ukuya phezulu nokuya ezantsii Ekhohlo nasekunene Sivelaphi isandi?
3.2	**Izinto ezingu3-D**				
	Nakana, wolathe uze unike amagama izinto ezineenkangeleko ezintathu (ezingu3-D) ezikhoyo eklasini	Chaza uze uhlole Thelekisa uze uhlele: - iibhola - iibhokisi ezineembuso ezisiskwere nezingamaxande (amacala)			

	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

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
	Chaza, hlela uthelekise izinto ezingu3-D	Thetha ngetshathi yokuqoqosha (yokuhlela izinto zokudlala) Hlela izinto ezingu3-D ngokwezi zinto (uphawu olunye): - ubungakananani (nkulu/ncinci) - umbala - imilo Yolatha uze uhlole izinto ezingu3-D: imilo emcaba, engqukuva, esisikwere okanye eluxande Izinto eziqengqelekayo Izinto tyibilikayo	Hlela izinto ezingu3-D ngokweempawu ezifanayo nezahlukileyo: - ubungakananani - umbala - imilo	Hlela izinto ezingu3-D ngokweempawu ezifanayo nezahlukileyo (iimpawu ezimbini): - ubungakananani - umbala - imilo Hlola izinto ezingu3-D: imilo emcaba, engqukuva, esisikwere okanye eluxande	Hlela izinto ezingu3-D ngokwezi mpawu (iimpawu ezimbini okanye ezingaphezulu): - ubungakananani - umbala - imilo Hlola izinto ezingu3-D: imilo emcaba, engqukuva, esisikwere okanye eluxande
	Yakha izinto ezingu3-D	**Ukuqhubeka** Gqithisa iibhloko zokwakha nezinye iimpahla zokwakha ngexesha lokuzidlalela ngokukhululekileyo ngaphakathi imihla ngemihla Hlola ngokusebenzisa iibhloko zokwakha	**Ukuqhubeka** Gqithisa iibhloko zokwakha nezinye iimpahla zokwakha ngexesha lokuzidlalela ngokukhululekileyo ngaphakathi imihla ngemihla Hlola ngokusebenzisa iibhloko zokwakha Sebenzisa iibhloko zokwakha nezinye izinto ezisenokusetyenziswa kwakhona ukuze wakhe ezakho izakhiwo	**Ukuqhubeka** Gqithisa iibhloko zokwakha nezinye iimpahla zokwakha ngexesha lokuzidlalela ngokukhululekileyo ngaphakathi imihla ngemihla Yakha ezakho izakhiwo ngokuthi ukope kumzekelo wesakhiwo osinikiweyo Khuphela isakhiwo esifanayo esithathwe kumzobo okanye kwikhadi elinomfanekiso	**Ukuqhubeka** Gqithisa iibhloko zokwakha nezinye iimpahla zokwakha ngexesha lokuzidlalela ngokukhululekileyo ngaphakathi imihla ngemihla Kuyaqhubeka ngexesha lokudlala ngokukhululekileyo ngaphakathi
3.3	**Iimilo ezingu2-D**				
	Nakana, wolathe uze unike amagama kwiimilo ezineenkangeleko ezimbini (ezingu2-D) eziseklasini	Thetha ngokuqoqosha/itshathi yoNcedo Nakana isimboli negama lomfundi Thetha ngeemilo ezingu2-D: isangqa, isikwere, unxantathu, uxande Iiphazile (ubuncinane amaceba ama6)	Nakana isimboli negama lomfundi Nakana, wolathe uze unike igama kwiimilo ezingu2-D: izangqa, izikwere, oonxantathu Iiphazile (ubuncinane amaceba ali12)	Nakana uze wolathe igama lomfundi Bethelela: isangqa, iskwere, unxantathu Thelekisa amaxande nezikwere Iiphazile (ubuncinane amaceba ali18)	Yolatha igama lomfundi Bethelela: uxande Nakana, wolathe uze unike amagama weemilo ezingu2-D: isangqa, isikwere, unxantathu, uxande Iiphazile (ubuncinane amaceba angama24)
	Chaza, uhlole uze uthelekise iimilo ezingu2-D	Hlela iimilo ezingu2-D ngo-: - kombala - kwemilo Isangqa: umgca onegophe Isikwere: amacala ama4, imigca eme nkqo, iikona Unxantathu: amacala ama3, imigca eme nkqo, iikona	Hlela iimilo ezingu2-D ngokokufana kunye nokwahluka: - milo Bethelela kunxantathu Bethelela kwisangqa nesikwere	Hlela iimilo ezingu2-D ngo-: - kombala - kwemilo (umgca onegophe, imigca emithathu okanye emine) Bethelela kwisangqa, isikwere kunye nonxantathu	Hlela iimilo ezingu2-D ngo-: - kobungakanani - kombala - kwemilo

	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)

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
	Ukuqondwa komgangatho wobume Iimilo zejiyometri	Thetha ngokuqondwa komgangatho wobume (yolatha izinto neemilo – 'Ndibona ngelisonyana lam') Thetha ngesangqa, isikwere kunye nonxantathu	Bethelela ekuqondweni komgangatho wobume ngokwenza imisetyenzana yokuhlela, ukumatanisa kwanokubeka ngokwamaqela kunye nesimbo sokuqoqosha Bethelela kunxantathu Ukugcinwa kwemilo (yenza ukuzinza kukanxantathu)	Bethelela ekuqondweni komgangatho wobume ngokwenza imisetyenzana yokuhlela, ukumatanisa kwanokubeka ngokwamaqela kunye nesimbo sokuqoqosha Bethelela kwisikwere Ukugcinwa kwemilo (yenza ukuzinza kweemilo ekusele kufundiwe ngazoukuza ngazo ukuza kuthi ga ngoku)	Bethelela ekuqondweni komgangatho wobume ngokwenza imisetyenzana yokuhlela, ukumatanisa kwanokubeka ngokwamaqela kunye nesimbo sokuqoqosha Bethelela kwisangqa, unxantathu, isikwere noxande Ukugcinwa kwemilo (yenza ukuzinza kweemilo ekusele kufundiwe ngazoukuza kuthi ga ngoku)
3.4	**Umatwatotse/ ulingano-macala (Nakana umgca wolingano-macala akho, nawoko kukungqongileyo)**	Yolatha amalungu omzimba Ukuwazi umzimba ngokuphathelele: - nokuba umzimba womntu unamacala amabini - elinye icala, nelinye icala, ukuya ekhohlo nasekunene - phezulu/ezantsi - umva/umphambili - ukunqumla phakathi naphakathi (imisebenzi efunisa usebenzise umzimba) Imisebenzi ekufanele yenziwe ngexesha lesifundo sokukhula ngokwasemzimbeni, ukusebenzisa izicengcelezo neengoma, nangexesha lokwenziwa koMsebenzi woBugcisa	Ukunqumla phakathi naphakathi – ukwenza iintshukumo Ukusebenzisa ukunqumla phakathi naphakathi (imisebenzi efunisa usebenzise umzimba) Ukusebenzisa ukunqumla phakathi naphakathi ngexesha lesifundo seZakhono zoBomi (ukukhula ngokwasemzimbeni) – ukusebenzisa izicengcelezo neengoma, nangexesha lokwenziwa koMsebenzi woBugcisa	Ukunqumla phakathi naphakathi (imisebenzi yasebhodini) Ukusebenzisa ukunqumla phakathi naphakathi ngexesha lesifundo seZakhono zoBomi (ukukhula ngokwasemzimbeni)	Khulisa ulwazi lokuba kukho ulingano-macala kwizinto Ukusebenzisa ukunqumla phakathi naphakathi ngexesha lesifundo seZakhono zoBomi (ukukhula ngokwasemzimbeni)

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. UMLINGANISELO					
	UMXHOLO	**IKOTA 1**	**IKOTA 2**	**IKOTA 3**	**IKOTA 4**
4.1	**Ixesha**	Thetha ngeengqikelelo zemini/zobusuku, ukukhanya/ ubumnyama; kusasa/emva kwemini/ebusuku (ngokuhlwanje) Thetha nge**nkqubo yemihla ngemihla** ibenemifanekiso ebekwe ukusuka ekhohlo ukuya ekunene kunye notolo olubonisa imisetyenzana ngokuye ihamba imini Thetha nge**tshathi yemozulu** (yemihla ngemihla) ibenegama losuku, umhla kunye nenyanga ikhatshwa yingoma nesicengcelezo, oonotsheluza kunye neelebhile zokubonisa kwaneesimboli nemifanekiso kwikhalenda emele iveki **Iintsuku zeveki** (imihla ngemihla) ulandelelaniso olufundwe ngengoma okanye isicengcelezo Bonisa imihla yokuzalwa, ukuphuma, imihla ekhethekileyo, iiholide eziphakathi kweveki Landelelanisa iinyanga zonyaka ngokusebenzisa ingoma Phuhlisa ulwazo lwengqikelelo yexesha Thetha nge**tshathi yamaxesha onyaka** ihlobo, ukwindla, ubusika, intwasahlobo Thetha nge**tshati yemihla yokuzalwa** kunye neminyaka yakho, umhla wokuzalwa (umhla nenyanga) Phuhlisa ulwazilokufunda izikhokelo zendlela	**Inkqubo yemihla ngemihla** (qhubeka) Bethelela kulandelelaniso lwezinto ezenzeka ngokuphindiweyo ngosuku olunye **Itshathi yemozulu** (yemihla ngemihla) ibenegama losuku, umhla kunye nenyanga ikhatshwa yingoma nesicengcelezo, oonotsheluza kunye neelebhile zokubonisa kwaneesimboli nemifanekiso kwikhalenda emele iveki **Iintsuku zeveki** (qhubeka) phinda ingoma okanye isicengcelezo mihla le Gqithisa ngowazi loko kwenziwa ngumfundi ukususela ekuvukeni kwakhe de ibelixesha lokuya kulala Gqithisa ngolwazi lokuba kwenzeka ntoni na ngexesha eliphakati kwesopholo nexesha lokulala **Itshathi yemihla yokuzalwa** iyaqhubeka lufika usuku lokuzalwa lomfundi **Itshathi yamaxesha onyaka** ihlobo, ukwindla, ubusika, intwasahlobo	**Inkqubo yemihla ngemihla** (qhubeka) Bethelela kulandelelaniso lwezinto ezenzeka ngokuphindiweyo ngosuku olunye **Itshathi yemozulu** (yemihla ngemihla) ibenegama losuku, umhla kunye nenyanga ikhatshwa yingoma nesicengcelezo, oonotsheluza kunye neelebhile zokubonisa kwaneesimboli nemifanekiso kwikhalenda emele iveki **Iintsuku zeveki** (qhubeka) **Itshathi yamaxesha onyaka** (qhubeka) **Itshathi yemihla yokuzalwa** iyaqhubeka lufika usuku lokuzalwa lomfundi	**Inkqubo yemihla ngemihla** (qhubeka) Bethelela kulandelelaniso lwezinto ezenzeka ngokuphindiweyo ngosuku olunye **Itshathi yemozulu** (yemihla ngemihla) ibenegama losuku, umhla kunye nenyanga ikhatshwa yingoma nesicengcelezo, oonotsheluza kunye neelebhile zokubonisa kwaneesimboli nemifanekiso kwikhalenda emele iveki **Iintsuku zeveki** (qhubeka) **Itshathi yamaxesha onyaka** (qhubeka) **Itshathi yemihla yokuzalwa** iyaqhubeka lufika usuku lokuzalwa lomfundi

	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			

	UMXHOLO	IKOTA 1	IKOTA 2	IKOTA 3	IKOTA 4
4.2	**Ubude** Thelekisa uze uhlele izinto usebenzisa isigama esifanelekileyo ukuze uchaze ubude	Ngexesha lokwenziwa rhoqo (imihla ngemihla) thetha ngengqikelelo yobude: de no-mfutshane, de, denyana no- de kakhulu Thetha ngetshati yobude Abafundi basenokuthelekisa ubude besebenzisa okuthile okuseklasini, umz. ikhabhathi: - yenza umlinganiselo usebenzisa izandla (okubonwayo okuzenzelekayo) - yenza umlinganiselo usebenzisa iinyawo	Ngexesha lokwenziwa rhoqo (imihla ngemihla) hlola ingqikelelo yobude: de no-mfutshane, de, denyana no- de kakhulu Thelekisa uze uhlele izinto ezimbini okanye ngaphezulu ngokubeka enye ecaleni kwenye Sebenzisa isigama esifanelekileyo ukuze uchaze ubude: de kakhulu no-futshane kakhulu, denyana n-futshanana Uthelekiso kwitshathi yobude: abafundi bafumanisa malunga nokuba bakhulile kusini na ukususela kwikota edlulileyo	Qikelela ubude bezinto ezahlukileyo Qikelela uze wenze umlinganiselo wezinto ezahlukileyo ngokusebenzisa iinyawo, izandla, umsonto, ukhuni Uthelekiso kwitshathi yobude: abafundi bafumanisa malunga nokuba bakhulile kusini na ukususela kwikota edlulileyo	Yenza umlinganiselo wobude babafundi ngokusebenzisa itheyiphi Uthelekiso kwitshathi yobude: abafundi bafumanisa malunga nokuba bakhulile kusini na ukususela kwikota edlulileyo
4.3	**Ubunzima** Sebenza kakuhle ekuthelekiseni nasekuhleleni izinto ngokusebenzisa isigama esifanelekileyo	Ukufunda ngebhaqo okwenzeka ngaphakathi nangaphandle Kuyaqhubeka ngexesha lokudlala ngamanzi nesanti	Ukufunda ngebhaqo okwenzeka ngaphakathi nangaphandle Kuyaqhubeka ngexesha lokudlala ngamanzi nesanti	Thetha ngengqikelelo yobunzima ngokuthelekisa ubunzima bezinto ezahlukileyo: - lula/nzima - lulana/nzinyana - lula kakhulu/nzima kakhulu	Bethelela kulwimi lobunzima ngexesha lemisebenzi eyenziwa ngaphakathi kwanelemisebenzi eyenziwa ngaphandle
4.4	**Umthamo/Ivolumu** Sebenza kakuhle ekuthelekiseni nasekuhleleni izinto ngokusebenzisa isigama esifanelekileyo	Ukufunda ngebhaqo okwenzeka ngaphakathi nangaphandle: akhonto/igcwele, ngentla kune-, nganeno kune- Kuyaqhubeka ngexesha lokudlala ngamanzi nesanti	Ukufunda ngebhaqo okwenzeka ngaphakathi nangaphandle Umdlalo wamanzi/ wesanti Sebenzisa izikhongozeli ukuthelekisa ubungakanani usebenzisa izikhongozeli eziqhelekileyo	Thetha ngengqikelelo yokulinganisa umthamo ngokuthi uthelekise ukuba izikhongozeli ezahlukileyo zithwala kangakanani na: - akhonto/igcwele - ingentla kune-/ inganeno kune-	Kuyaqhubeka ngexesha lokudlala ngamanzi nesanti Bethelela kulwimi lomthamo ngexesha lemisebenzi eyenziwa ngaphakathi kwanelemisebenzi eyenziwa ngaphandle
4.5	**IPherimitha nobuKhulu beNdawo**	Akukho mxholo kaCAPS kwiBanga lakwa-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. ULWAZI OLUQOKELELWEYO					
	UMXHOLO	**IKOTA 1**	**IKOTA 2**	**IKOTA 3**	**IKOTA 4**
5.1	**Ukuqokelela nokuhlela izinto** Qokelela uze uhlele izinto eziphathekayo ngokophawu olunye, umz. ubungakanani bamagqabi	Thetha ngengqikelelo yokusetyenziswa kolwazi: - qokelela uze uhlele ulwazi, umz. Mangaphi amakhwenkwe/ amantombazana aseklasini? - hlela ulwazi ngokuthi abafundi beme emgceni wamakhwenkwe/ wamantombazana	Qokelela izinto (iintswazi) ezingalinganiyo ngobungakanani/ ngobude) Hlela izinto eziqokelelweyo (iintswazi)	Buza umbuzo: 'Ingaba axhaphakile amagama anezandi ezintandathu?' Qokelela ulwazi ukuze uphendule umbuzo usebenzisa amakhadi anamagma abafundi Hlela amakhadi amagama ngokwenani lezandi zegama ngalinye	Qokelela idatha: Ngoobani abantsuku zokuzalwa zikwinyanga nganye? Hlela ulwazi ngokwenyanga yokuzalwa yomfundi ngamnye Qokelelaulwazi, umz. Ngowuphi owona mbala wentlama yokudlala uwuthandayo? Khetha ibhloko ibenye emele umbala owuthandayo wentlama yokudlala kwiveki nganye Qokelela ulwazi: Sesiphi isithuthi esisetyenziswa ngabafundi xa besiza esikolweni? Hlela ulwazi oluqokelelweyo (bahamba ngeenyawo, ngemoto yomzali, ngeteksi okanye ngebhasi)
5.2	**Beka okuthile endaweni yengqokelela ehleliweyo yezinto**	Beka okuthile endaweni kwigrafu usebenzisa izinto eziphathekayo Yenza igrafu emele ulwazi ngokusebenzisa iibhloko okanye iimilo Yenza igrafu yemifanekiso	Yenza igrafu ebonisa ulwazi (iintswazi) Zoba umfanekiso njengerekhodi yezinto eziqokelelweyo	Yenza igrafu ngokuncamathisela ikhadi legama ngalinye ngaphantsi kwekholamu efanelekileyo Yenza igrafu yemifanekiso	Yenza igrafu emele imihla yokuzalwa yabafundi kwinyanga nganye Sebenzisa izinto zokwenene ukuze wenze igrafu, izinto ezinjengeebhloko ukumela umbala wentlama yokudlala oceba ukyenza, umz. ozuba, omthubi, oluhlaza Yenza igrafu yemifanekiso emele abafundi ababamba ngeenyawo, abeza ngeteksi, ngemoto, ngebhasi
5.3	**Xoxa uze unike ingxelo ngengqokelela ehleliweyo yezinto**	Funda uze utolike ulwazi ngokusebenzisa intlama yokudlala ezakumela inani lamakhwenkwe namantombazana akhoyo eklasini Phendula imibuzo ngokwendlela ozihlele ngayo izinto Mangaphi amagqabi amakhulu owazobileyo? Ngawaphi awona maninzi, ngamagqabi amakhulu okanye ngamagqabi amancinci? Mangaphi amaninzi/ angaphezulu/anganeno/ alingana ne?	Funda uze utolike iigrafu usebenzisa imibuzo Phendula imibuzo ngokokwemifanekiso okanye izinto zakho	Funda uze utolike ulwazi ngokubala amakhadi amanani kuluhlu ngalunye ukuze ufikelele kwisigqibo kwikholamu nganye uze uqukumbele	Funda uze utolike iigrafu usebenzisa imibuzo ukuze uqonde ukubayeyiphi inyanga enabona bantu baninzi ababhiyozela imihla yabo yokuzalwa Ngokuphathelele kokukhethwe ngabafundi, umbala wentlama yokudlala kuloo veki uyakuba ngomthubi Funda uze utolike iigrafu (Bangaphi abahamba ngeenyawo, abeza ngeteksi, ngebhasi, njl.?)

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

Amanani, iiOpareyshini noLwalamano

Ukuqonda inani

Abantwana baphuhlisa intsingiselo yenani nokubala ngokusebenzisa amava abo emihla ngemihla. Basebenzisa oku ekuqaliseni ukwenza unxibelelwano phakathi kweentsingiselo ezahlukeneyo zenani. Bafumanisa ukuba amanani angasetyenziswa ngokwahlukileyo kwiimeko ezahlukeneyo. Umzekelo, 'u-ntlanu' angasetyenziswa:

- ukuchaza isixa ('ubungakanani'): 'Ndineelekese ezintlanu.'
- ukuchaza ukulandelelana kwezinto: 'Ungumntu wesihlanu emgceni.'
- njengomlinganiselo: 'Uneminyaka emihlanu ubudala.'
- njengeleyibheli: 'Sihlala kwanombolo ntlanu.'
- kubalo: '2 + 3 = 5'

Amanani ziimbono okanye iikhonsepthi zobungakanani bento. Abafundi baqala ukuqonda ukuba 'untlanu' uthetha ukuba kukho izinto ezintlanu, kwaye untlanu angayindawo yesihlanu emgceni, okanye 'untlanu' angasixelela ukuba zingaphi izinto. Amanani anxibelelana ngokuthe ngqo, ulwazi olucacileyo, ngengqokelela nesixa sezinto, iziganeko okanye amanyathelo.

Umfanekiso 42 Iintsingiselo ezahlukeneyo zika'ntlanu'

Amanani ziikhonsepthi eziqikelelwayo. Awazo zinto ezibambekayo okanye eziphathekayo. Achaza into ethile ngezinye izinto. Umzekelo, njengokuba igama elithi 'luhlaza' lingasetyenziswa ukuchaza umbala weapile, inani elingu'ntandathu' lingasetyenziswa ukuchaza inani lama-apile kwingqokelela. Ukuba umntu ucela ukuba umnike ipleyiti uyakwazi ukumnika into ebambekayo, kodwa ukuba umntu ucela ukuba umnike u'ntlanu' awukwazi ukumchola umnike.

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.

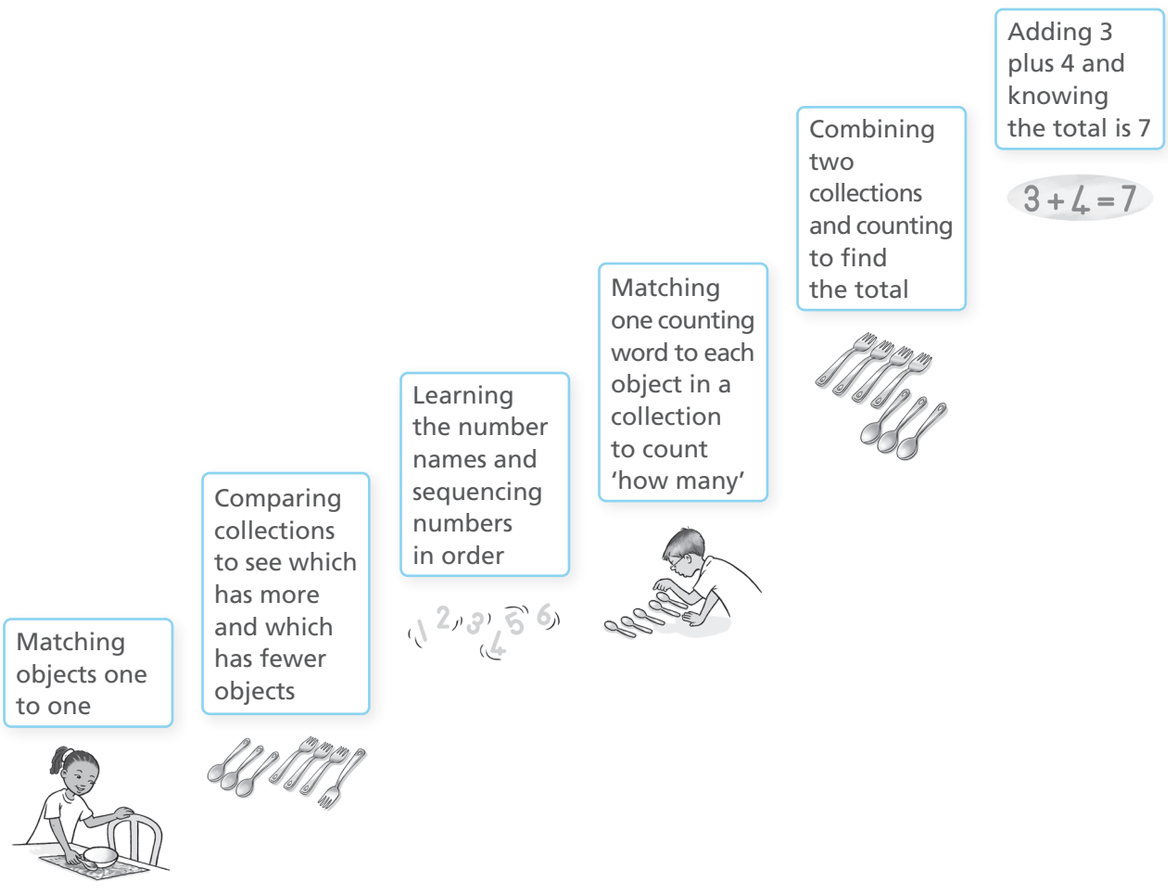


Figure 43 Progression

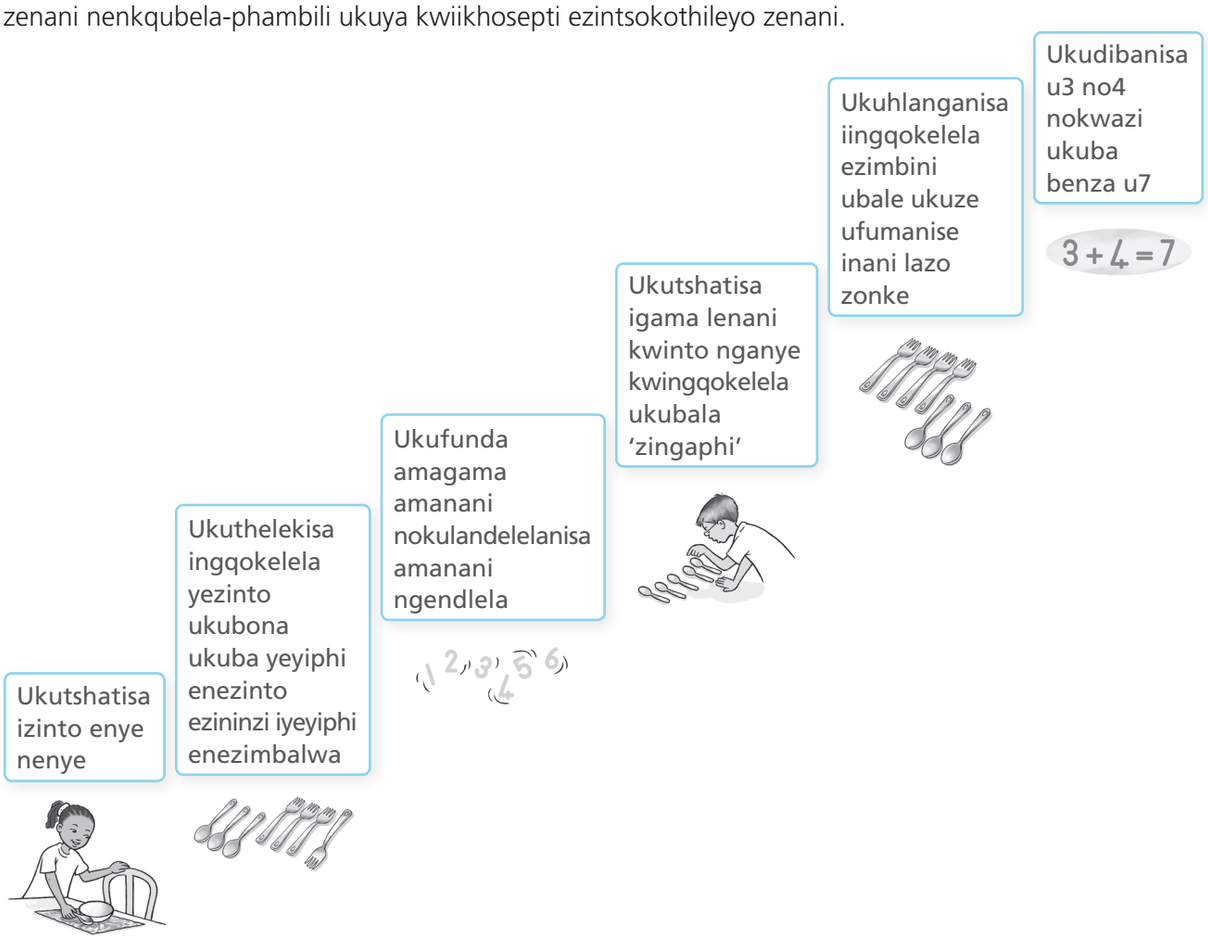
Unokucinga ngokumnika inani u ‘5’ obhalwe ekhadini okanye umnike izinti ezintlanu, okanye ubonise iminwe emihlanu. Akunakwenzeka ukubonisa inani ngokwalo kuba yingcamango esezintlokweni zethu, ngoko sifumana iindlela zokubonisa okanye ukumela inani, ezifana nokusebenzisa ingqokelela yezinto, umfanekiso okanye uphawu olufana nenani okanye igama.

Ukuziqhelisa ...

Nceda abafundi bakhulise ulwazi olutsha lwemathematika kunye neekhonsepthi ezisekelwe kumava abo emihla ngemihla:

- Tsala umdla kulwazi lwabafundi lwangaphambili xa usazisa iikhonsepthi ezintsha zemathematika.
- Sebenzisa iimeko ezibonwayo ukubonisa iikhonsepthi ezintsha zezibalo.
- Yenza unxulumano phakathi kwemisebenzi yemihla ngemihla neekhonsepthi.
- Cwangcisa imisebenzi eyakhela kwaye iphuhlise nzulu ukuqonda kwabafundi ngeekhonsepthi zemathematika.

Umfanekiso 43 ubonisa inkqubela-phambili yokulula ukusuka kwimisebenzi yemihla ngemihla ukuya kwiikhonsepthi zenani ezintsonkothileyo kwiBanga R. Uqala ngemisebenzi yemihla ngemihla enonxulumano namanani neekhonsepthi zenani nenkqubela-phambili ukuya kwiikhosepti ezintsokothileyo zenani.



Umfanekiso 43 Inkqubela-phambili

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.

Ukumela inani

KwiBanga R, abafundi basebenzisa iisimboli **ukumela** amagama, imifanekiso neembono. Abantwana baqala bafunde ukumela iimbono okanye izenzo ngemidlalo yelizwe lokuzakhela (imidlalo yokulinganisa), umzekelo iingalo zomfundi zibangamaphiko enqwelomoya njengoko ejikeleza egumbini, okanye umfundi usenokubenzisa isiciko seplastiki njengevili ukuqhuba imoto.

ULUHLU LWEENKCAZELO

ukumela
ukusebenzisa izinto, iisimboli okanye izenzo ukubonisa umbono okanye ikhonsepthi

Abafundi baqalisa ukumela amanani besebenzisa iminwe yabo baze ngokuthe chu baqalise ukusebenzisa ezinye iindlela, ezifana nezinto, imizobo, imifanekiso okanye iisimboli. Abafundi baqhubela phambili besebenzisa:

- izinto zokwenene ukumela amanani, umz. iilamuni, iilekese, iipensile, amagqabi
- imifanekiso okanye imizobo ukumela izinto, umz. umzobo welamuni, umntu, imoto
- izixhobo zokubala ukumela izinto okanye imifanekiso, umz. idiski zeplastiki ukubonisa inani leelamuni
- amanqaku ukumela izinto eziphathekayo kunye nemifanekiso, umz. izangqa, amachaphaza, iimpawu zokuqhoqhoza
- iisimboli zamanani ezibhaliweyo kunye namagama amanani, umz. '2' okanye 'mbini'.

Nazi ezinye iindlela ezahlukileyo zokumela inani u-'ntlanu'.

Umfanekiso 44 Iindlela ezahlukileyo zokumela 'untlanu'

Iintlobo ezahlukeneyo zamanani

Kukho iindidi ezahlukeneyo zenani kwinkqubo yamanani. **KwiBanga R sigxila kuphela ekuqondeni nasekusebenziseni amanani apheleleyo (amanani okubala).**

Kumabanga aphezulu, abafundi baya kufunda ukuba:

- ii-**inteja** ziquka amanani apheleleyo namanani amancinci kunoziro
- **amanani engqiqo** aquka amanani apheleleyo, amanani amancinci kunoziro, iidesimali namaqhezu.

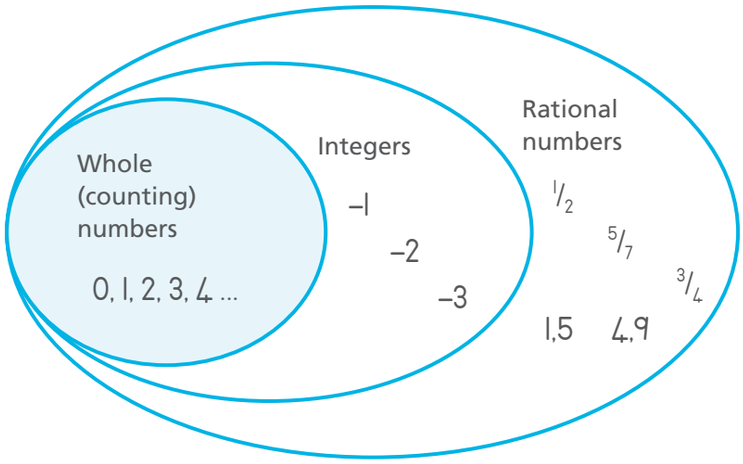


Figure 4.5 In Grade R the focus is on whole numbers.

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.

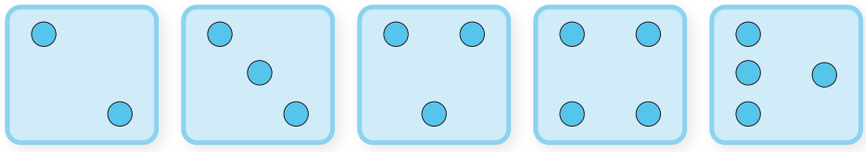
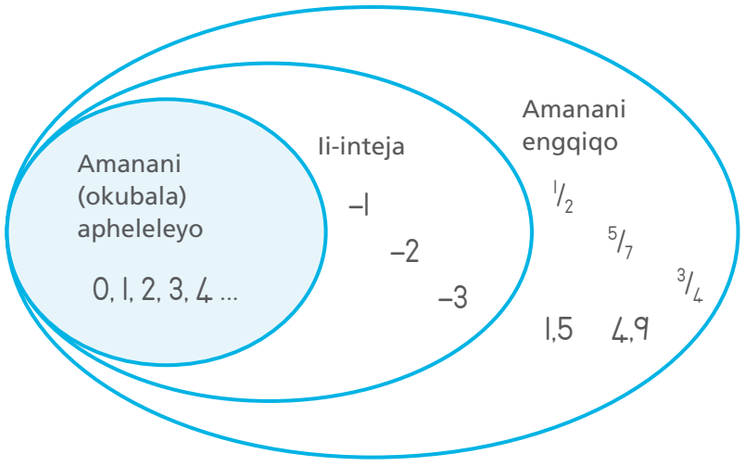


Figure 4.6 Dot arrangements for two, three and four

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.



Umfanekiso 4.5 KwiBanga R kugxilwa kumanani apheleleyo.

Ukwazi isiphumo ungakhange ubale (ukusabhathayza)

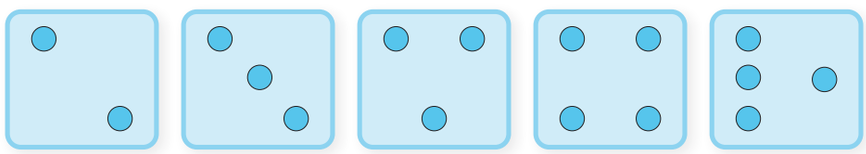
Ukusabhathayza kubandakanya ukuqaphela ngokukhawuleza, ngaphandle kokubala, inani lezinto kwiingqokelela ezincinci. Ukusabhathayza sisakhono sokuqala esifumaneka ngaphambi kokufunda amagama amanani kunye neesimboli okanye ukufunda ukubala. Ukusabhathayza kwenza isiseko esiluqilima sokubala iingqokelela zezinto nokubala kwangethuba.

ULULHU LWEENKCAZELO

ukusabhathayza
ubuchule bengqondo bokuqaphela ngokukhawuleza inani lezinto lilonke kwingqokelela ngaphandle kokubala

Ukusabhathayza ngombono

Ukusabhathayza ngombono bubuchule bokuqaphela ngokukhawuleza inani lezinto kwingqokelela encinci. Abantwana abancinci bayakwazi ukubona okanye ukuqaphela umahluko phakathi kwenani lezinto kwingqokelela, ngaphandle kokubala, kwaye bangaxela ukuba zeziphi ezininzi okanye zeziphi ezimbalwa ngaphandle kokwazi amagama amanani okanye iisimboli. Rhoqo, bangasebenzisa iminwe yabo ukutshatisa nokubonisa inani elifanayo lezinto. Ngokuthe chu bafunda ukutshatisa amagama amanani kwingqokelela kwaye bayakukwazi ukuxela, ngaphandle kokubala, ukuba inye, zintathu, zimbini, zintlanu izinto kwingqokelela. Olu hlobo lokusabhathayza lwenzeka kuphela kwinani elincinci lezinto kwaye abantwana abaninzi nabantu abadala bangakwazi ngokuchanekileyo ukukwenza oku ukuya ku-ntlanu.



Umfanekiso 4.6 Ulungiselelo lwamachaphaza kambini, untathu kunye none

Ukusabhathayza kwengqiqo

KwiBanga R ubuchule babafundi bokuqaphela ukuba ‘zingaphi’ izinto ezikhoyo kwingqokelela buyakhula. Bungakhula buye kufikelela kubungakanani obungaphezulu kukantlanu ngokusebenzisa imifanekiso yamanani enjengokulungiselela amachaphaza akwidayisi, iidomino kunye neefreyimu ezilishumi.

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

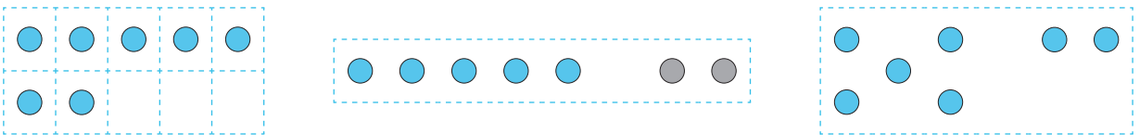


Figure 47 Dot arrangements for seven

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.

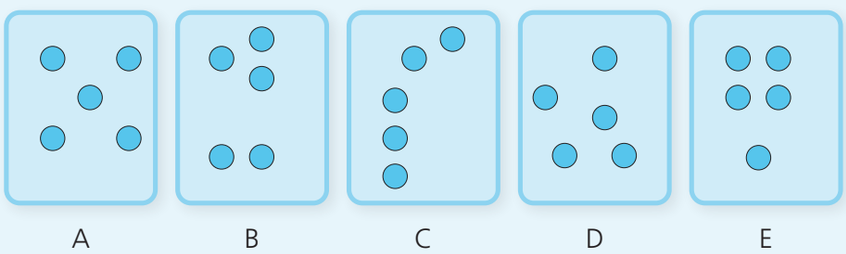


Figure 48 Dot cards

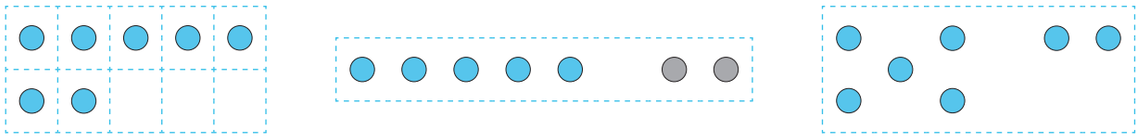
Activities such as dominoes and dice games provide fun opportunities to practise subitising skills.

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'.

Kwimizekelo engezantsi, ngokusebenzisa ukusabhathayza kwengqiqo abafundi banokuqaphela ngokukhawuleza ukuba kula makhadi lilinye libonisa izinto ezisixhenxe.



Umfanekiso 47 Ulungiselelo lwamachaphaza kasixhenxe

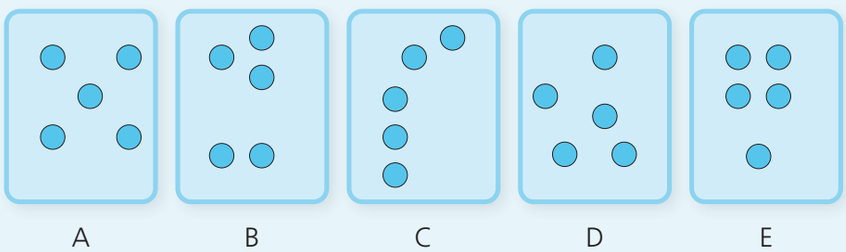
Le ndlela yongezelelweyo yokusabhathayza ibizwa ngokuba kukusabhathayza kwengqiqo. Isekwe kwinxalenye yolwazi kwaye ivumela abafundi ukuba bakhawuleze ukuchonga amanani angaphezulu kukantlanu.

Ukuziqhelisa ...

Abafundi bayakonwabela ukudlala imidlalo ebandakanya ukukhawuleza ubonise inani lezinto ezincinci phambi kokuba uzifihle, emva koko ubuze ukuba bezingaphi. Imidlalo yokutshatisa nokubala iyakudibanisa ukusabhathayza, umzekelo, ukuqaphela inani lezinto ngaphandle kokuzibala. Oku kuyakunceda abafundi ekukhumbuleni iindibaniselwano zamanani ngentloko ukuya kwishumi kwakunye nobalo lokuqala (ukudibanisa nokuthabatha).

Amakhadi anamachaphaza angasetyenziswa uku:

- bonisa iindlela zokubeka inani ukusuka kunye ukuya kuntlanu
- xhasa uphuhliso lokuqaphela amanani amancinci
- nxulumanisa amagama amanani neengqokelela ezincinci
- tshatisa izixhobo zokubala namachaphaza.



Umfanekiso 48 Amakhadi anamachaphaza

Imisebenzi efana needomino nemidlalo yedayisi ibonelela ngamathuba anika umdla okuziqhelisa nezakhono zokusabhathayza.

Ukubala

Ukubala sisakhono esintsonkothileyo esifuna ukuziqhelisa okuninzi. Abafundi basiphuhlisa ngokuziqhelanisa nokubala izinto zokwenyani. Basoloko beqala ngokulinganisa ukubala kwabafundi abadala kunye nabantu abadala.

Kukho imisebenzi emibini ebandakanya ukubala. Owokuqala kukubala ngomlomo (ukhwaza) okanye ngentloko okubandakanya ukugcina amagama nokulandelelanisa ukubala amanani, inkoliso kwisicengcelezo okanye kwingoma. Owesibini kukubala izinto nganye nganye, ukufumanisa ukuba 'zingaphi'.

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.

Ukubala ngomlomo

KwiBanga R, abafundi bafunda ulandelelwano oluchanekileyo lwamagama amanani baluphinde ulandelelwano yonke imihla, ngokubala bekhwaza. Olu hlobo **lokubala ngomlomo** lukwabizwa ngokuba k**ukubala ngentloko** okanye k**ukubala ucengceleza**. Injongo yokubala kukhwazwa kukunceda abafundi baqonde ukuba xa sibala kukho ulandelelwano lwamagama amanani, kuqalwa ku-nye, kulandele umbini, ntathu, ne. Ekuqaleni, abafundi abaqondi ngokupheleleyo intsingiselo yamagama amanani kwaye bangawadlula amanye amanani kulandelelwano lokubala.

Ukucengceleza isicengcelezo okanye uthotho lwamanani ngomlomo kuthetha ukuphindaphinda amanani ngentloko. Nokuba abafundi babala ngezibini, izihlanu kunye nezishumi, besebenzisa ulwazi lwabo lokulandelelanisa amanani. Ukufunda amagama amanani nokuwaphindaphinda ngendlela efanelekileyo akuthethi ukuba abafundi bayakwazi ukubala. Oku kwahlukile kukubala ufumanisa ukuba 'zingaphi'.

ULUHLU LWEENKCAZELO

ukubala ngomlomo/ ukubala ngentloko/ ukubala ucengceleza
ukubala ukwaza, ubiza amanani ngendlela eyiyo

ukubala ngengqiqo/ ukubala okuneziphumo
ukubala izinto ukufumanisa ukuba 'zingaphi'

Ukubala izinto

Ukubala izinto kukwabizwa ngokuba **kukubala ngengqiqo** okanye **ukubala okuneziphumo**. Oku kuthetha ukuba izinto okanye iziganeko zitshatiswa negama lenani. Ukubala 'zingaphi', abafundi kufuneka baqonde ukuba into nganye kwingqokelela ifumana igama lenani ('nye, mbini, ntathu, ne …') kwaye ubala into kube kanye kuphela.

Ngemisebenzi emininzi ebayenzayo nekhokelwa ngutitshala, abafundi baqala ukuqonda nokusebenzisa le migaqo yokubala ilandelayo:

1. **Umgaqo wohambelwano lwamanani:** Ukutshatisa into enye, kwaye enye kuphela, ukubala igama lenani kwinto nganye ebalwayo ekwingqokelela. Ekuqaleni abafundi basenokubala into enye kabini, batsibe into okanye balibale ukuba zeziphi izinto esezibaliwe. Kuluncedo kubafundi ukubamba basuse izinto ngelixa bezibala.
2. **Umgaqo wocwangco oluzinzileyo:** Amagama amanani asoloko ecwangciswe ngendlela engaguqukiyo, umz. u-nye ulandelwa ngumbini, umbini ulandelwa nguntathu, untathu ulandelwa ngune, njalonjalo.
3. **Umgaqo obonisa ubungakanani:** Igama lenani lokugqibela elibizwayo xa kubalwa ingqokelela yezinto limele inani lezinto zonke ezikwingqokelela.
4. **Umgaqo wokuthintela:** Abafundi baqonda ukuba nangona amaqela anezinto ezilinganayo abonakala ehlukile kakhulu (umz. iidiliya ezintlanu, abantu abahlanu, izindlu ezintlanu) anomlingano ofanayo, ukutsho oko 'ubuhlanu'. Bayaqonda ukuba ukubala kunokusetyenziswa kwizinto, kwimifanekiso, kwimibala, kwiimilo, okanye kwiintshukumo okanye kwizandi.
5. **Umgaqo wocwangco olungahambelaniyo:** Ulungelelwaniso lokubala izinto kwingqokelela alunamsebenzi. Abafundi kufuneka baqonde ukuba nakuba sizicwangcisa kanjani izinto, inani lazo zizonke izinto kwingqokelela lihlala lifana.

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.

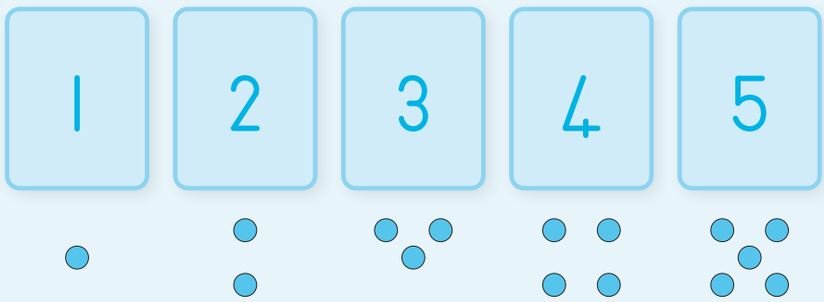


Figure 50 Counters represent number quantities in order.

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.

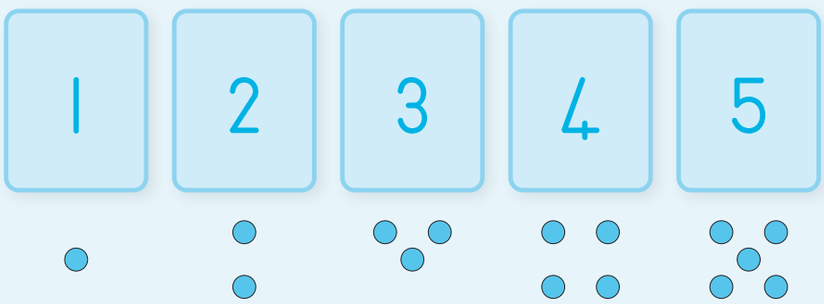
Umfanekiso 49 Imizekelo yomlinganiselo womda

Xa abafundi beqondile kakuhle bekwazi nokusebenzisa yonke le migaqo emihlanu yokubala, sinako ukutsho siqinisekile ukuba bayakwazi ukubala.

Ukuziqhelisa ...

Ngokuziqhelisa, abafundi baqonda ukuba ukubala kunokusetyenziswa ekuthelekiseni ingqokelela yezinto. Xa abafundi bekwazi ukubala ngolandelelwano okanye ukulungelelanisa amanani abalwayo ba:

- qalisa ukuqonda ukuba inani ngalinye kulandelelwano lokubala likhulu ngesinye ngaphezulu kwinani eliphambili, libelincinci ngesinye kwinani elisemva kwalo.
- nako engqondweni ukuthelekisa amanani babone ukuba umbini mkhulu kunonye kwaye nontathu mkhulu ngonye kunombini.
- qaphela ukuba amanani akhula ngesinye lonke ixesha nokuthi naliphi na inani kulandelelwano lokubala lingaphezulu ngesinye kwinani elingaphambili.



Umfanekiso 50 Izixhobo zokubala zimele ubungakanani benani kulungelelwaniso.

Uqikelelo

Nangona ukubala kumalunga nokufumanisa kanye inani lezinto kwingqokelela, abafundi kufuneka baphuhlise izakhono zokuqikelela ukuze bakwazi ukuthi 'malunga' nezingaphi izinto kwingqokelela. Kufuneka bakwazi ukusebenzisa amagama afana no 'ninzi', 'mbalwa', 'ngaphezulu', 'ninzi kakhulu' okanye 'fanayo ne'. Ukuqikelela kumalunga nokuba abafundi besebenzise ukuqonda kwabo amanani ukwenza iqashiso elifanelekileyo nelichanekileyo ngomlinganiselo nezixa lo gama beqonda ukuba akuyomfuneko ukuba uqikelelo luchaneke. Abafundi badla ngokungafuni ukwenza uqikelelo kuba lunongachaneki.

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.

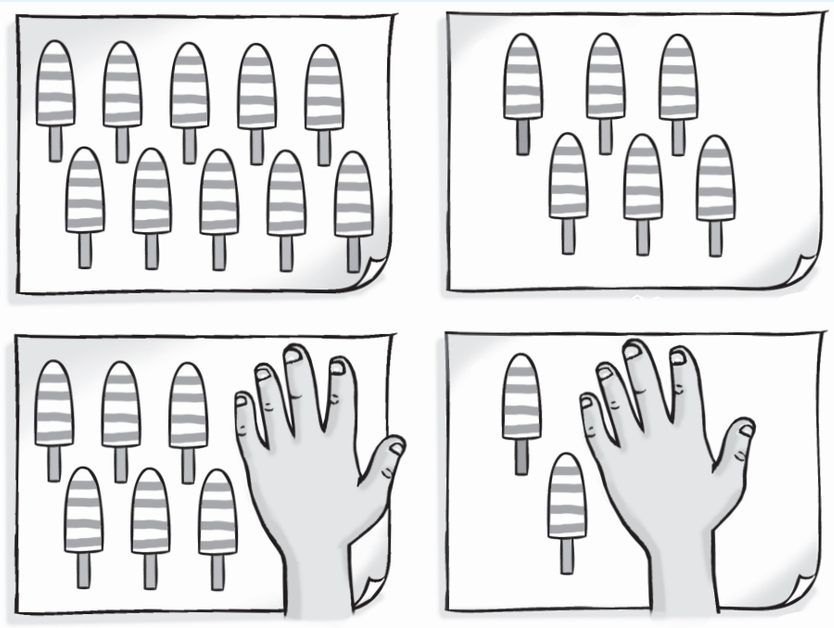


Figure 51 Estimating based on the visual image that is seen

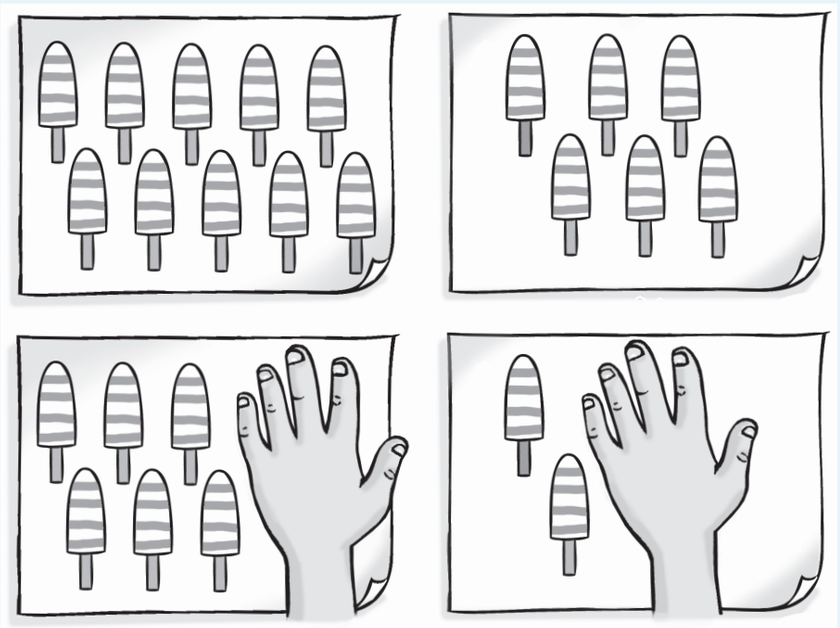
Ordinal numbers

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'.

Ukuziqhelisa ...

Nangona abafundi benokungakwazi okwangoku ukubala inani lezinto ngokucacileyo, bangakwazi ukufumana impendulo ngokuqikelela.

- Ngokusekwe kumfanekiso wokubonakalayo abafundi bangabona ukuba kukho izinto ezininzi emfanekisweni. Bangakwazi ukutsho ukuba ngowuphi owona unezinto ezininzi okanye ezimbalwa.
- Abafundi bangakwazi ukufumana impendulo ngokusebenzisa ukutshatisa izinto enye nenye kwiingqokelela ezimbini ukuthelekisa ukuba yeyiphi ingqokelela enezona zininzi iyeyiphi enezimbalwa.
- Abafundi bangathelekisa inani lezinto kwimifanekiso emibini ngokukrwela umgca kwizinto ezinenani elifanayo kumfanekiso ngamnye.
- Abafundi basenokubenzisa izandla zabo ukugquma inani lezinto, umzekelo iiayiskhrim ezine kumfanekiso ngamnye. Kuyacaca ukuba zininzi iiayskhrim ezingagqunywanga kumfanekiso wokuqala.



Umfanekiso 51 Ukuqikelela okusekelwe kumfanekiso wokubonwayo

Amanani olandelelwano

Amanani olandelelwano asetyenziswa ukuchaza indawo okanye isikhundla somntu okanye sento, umz. emgceni okanye kumqolo. Abafundi bayaqonda ukuba xa bebaleka ugqatso abaphumi 'ezintathu' koko baphuma kwindawo 'yesithathu'. Ngendlela efanayo, bayayazi ukuba abami 'inye' emgceni kodwa uba 'ngowokuqala'.

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).

Umfanekiso 52 Indawo yokuqala, eyesibini neyesithathu

Ukubala

Ukuqonda okukuko kwenani nokubala kubalulekile ekufundeni iindlela zokubala. Abafundi kufuneka baqale baqonde ubudlelwane phakathi kwamanani: ukuthelekisa, ulungelelwaniso nokohlula (ukuqhekeza nokwakha) ukwenzela ukuba bafunde iiopareyshini zenani, ezinjengo kudibanisa, ukuthabatha, ukuphindaphinda nokwahlulahlula.

Imisebenzi namava abandakanya ukucazulula nokwakha amanani, ukudibanisa nokuthelekisa iingqokelela ziziqalo zeekhonsepthi zokudibanisa (udibaniso) nokususa (ukuthabatha). Abafundi beBanga R nabo bahlala bekubona ukudibanisa nokuthabatha ngexesha lemidlalo yabo yemihla ngemihla kunye nemisebenzi, umz. xa bedlala kunye 'ivenkile' okanye besabelana ngezinto zokudlala. Xa bethabatha, abafundi kufuneka bathathe inxaxheba kwimisebenzi eyenziwayo equka 'ukususa', ngamanye amazwi, ukufumana ukuba zingaphi ezishiyekileyo kwingqokelela yezinto xa ezinye zisusiwe. Ekuqaleni abafundi baya kusebenzisa iindlela zokubala ukusombulula iingxaki eziquka ukudibanisa okanye ukuthabatha, umz. ukubala zonke izinto kwiingqokelela ezimbini ukufumana isixa sezinto zizonke xa iingqokelela zidityanisiwe, okanye ukubala ukuba zingaphi iinkozo ezishiyekileyo xa ezinye zisusiwe.

Uphindaphindo, ukwahlula namaqhezu azifundiswa ngokusesikweni kwiBanga R, kodwa abafundi bayazisebenzisa ezi khonsepthi xa besombulula iingxaki eziquka ukwenza amaqela ezinto naxa besabelana ngezinto ngokulinganayo. Imisebenzi ebandakanya ukudibanisa ngophindaphindo nokuthabatha ngophindaphindo kubeka isiseko seekhonsepthi yophindaphindo nokwahlulahlula. Le misebenzi ikwanceda ukuseka ulwalamano phakathi kokudibanisa nophindaphindo, ukuthabatha kunye nokwahlulahlula, ekufuneka kuqondiwe kwilixa elilandelayo esikolweni.

Ukuziqhelisa ...

Nika abafundi iingxaki zokuba baphonononge ukwenza amaqela alinganayo kunye nokwabelana ngokulinganayo, umzekelo:

- Cela abafundi abathathu elowo athathe izixhobo zokubala ezimbini. Bedibene mababale inani elipheleleyo lezixhobo zokubala, umz. umbini nombini benza une kunye nombini benza untandathu (ukudibanisa okuphindiweyo).

- 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.

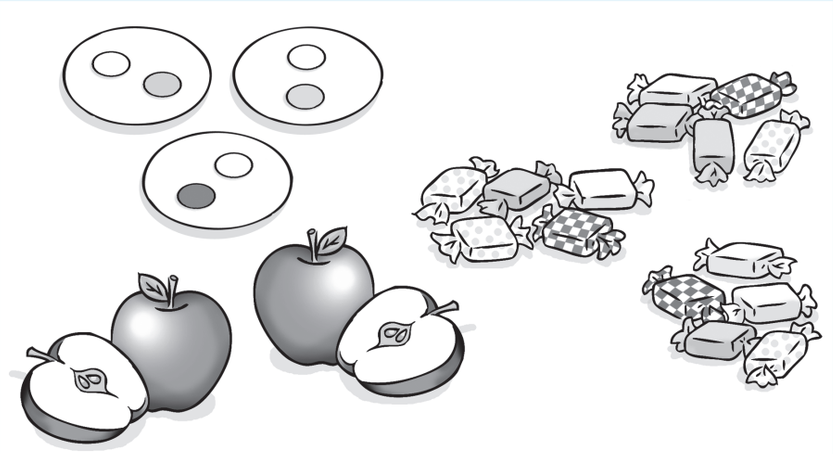
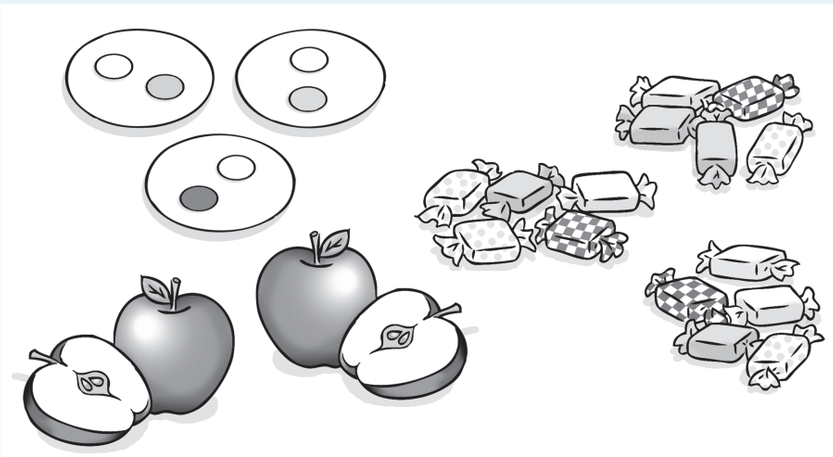


Figure 53 Using objects for calculations

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?

- Beka izixhobo zokubala ezintandathu emethini. Susa ezimbini ngexesha umane uthetha usithi ‘thandathu uthabathe umbini kushiyeka une, uthabathe umbini kushiyeke umbini uthabathe amagqabi amabini kungashiyeki nto’ (ukuthabatha okuphindiweyo).
- Nika abafundi izangqa ezisikiweyo zakhutshwa. Bacele ukuba benze amaqela alinganayo kwisangqa ngasinye usebenzisa izixhobo zokubala, umz. ezimbini kwisangqa ngasinye.
- Cela abafundi ukuba babelane ngezinto ngokulinganayo, umz. yaba izixhobo zokubala ezili15 phakathi kwabafundi abathathu.
- Cela abafundi ukuba babelane ngezinto apho intsalela kufuneka kwabelwane ngayo, umz. ukwabelana ngama apile amabini ngokulinganayo phakathi kwabafundi abathathu.



Umfanekiso 53 Ukusebenzisa izinto kubalo

Imibuzo enokubuzwa kuManani, iiOpareyshini noLwalamano

- Ungazibeka ezi zinto ngendlela eyohlukileyo?
- Zingaphi ezilapho?
- Zingaphi onokuzibala?
- Ngubani onezininzi/ezimbalwa?
- Leliphi inani eliza phambi …? Leliphi inani eliza emva …? Leliphi inani eliphakathi … no …?
- Zingaphezulu ngezingaphi kweli qela?
- Ukuba sabelana ngokulinganayo ngezi zinto phakathi kwethu, zingaphi ezinokufunyanwa ngumntu omnye?
- Ukuba ndigquma ezinye zezi, zingaphi ezifihliweyo?
- Leliphi eli nani? (bonisa ikhadi lenani okanye inani elibhaliweyo)
- Ungawabeka amakhadi amanani ngokulandelelana?
- Ngubani omi ekuqaleni, owesibini, …?
- Ukuba unezinto ezimbini ndaze ndakunika ezimbini ngaphezulu, zingaphi oza kuba nazo?
- Ukuba ndinezi zinto ezintathu ndize ndikunika enye, zingaphi endiza kuba nazo?

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

Isigama sAmanani, iiOpareyshini noLwalamano

Bala kwaye uqaphele amanani

- tshatisa, hlela, thelekisa
- inani
- nye, mbini, ntathu … amashumi amabini nangaphezulu
- ngekhoyo, akukho nto, engenanto, unothi, uziro
- zingaphi …?
- bala (ukuya) ku
- bala uqhubeke (ukuqala, ukuya)
- bala ubuya umva (ukuqala, ukuya)
- bala ngonye, ngezibini … ngezishumi …
- ngaphezulu, ninzi, mbalwa, mbalwa kakhulu
- mbalwa kune, ninzi kune, ninzi kunazo zonke, mbalwa kunazo zonke
- ninzi kakhulu, mbalwa kakhulu, zanele, azanelanga
- onke amanye
- iqela, ingqokelela
- phantse, isondele kwi-, phantse yalingana nenye
- zingaphi ezishiyekileyo, eseleyo
- ngaphezulu nje, ngaphantsi nje

Thelekisa ulandelelanise amanani

- tshatisa, hlela, thelekisa, landelelanisa
- inani elifanayo ne-, ezininzi njenge-
- ngaphezulu ngenye, ngaphezulu ngezimbini, …
- ngaphantsi ngenye, ngaphantsi ngezimbini, …
- phambi kwe, emva, ecaleni, ecaleni kwe, phakathi
- owokuqala, owesibini, owesithathu … oweshumi
- eyokugqibela, phambi, emva

Kwizinto **ezimbini**/ubungakanani: nkulu kune-, ngaphezu, nkulwana, mbalwa, mbalwa kune-, ncinci, ncinci kakhulu

Eye**zintathu** okanye izinto ezingaphezulu/ubungakanani: inkulu kakhulu, zininzi, eyona inkulu, zimbalwa, ezona zimbalwa, eyona incini

Ukusebenza ngamanani

Ukudibanisa nokuthabatha

- tshatisa, thelekisa
- dibanisa, ngaphezulu, no
- zonke, zizonke
- phinda kabini/ihafu (isiqingatha)
- enye ngaphezulu, ezimbini ngaphezulu, …
- zingaphi ekufuneka zenziwe ngaphezulu …?
- zingaphi ezingaphezulu ku-… kune …?
- susa, thabatha
- ngaphantsi ngenye, ngaphantsi ngezimbini, …
- zingaphi ezishiyekileyo/eziseleyo?
- umahluko phakathi kwe-

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

Uphindaphindo nokwahlula

- iinyanda, amaqela ezibini, zithathu, …
- ukwabelana kakuhle/ngokulinganayo
- yabelana, yabelana phakathi kwa-/kwi-
- yabelana ngenye/ngaphezulu kwenye ngexesha
- iyafana ne-, yohlukile kwi-
- zingaphi ezishiyekileyo, eziseleyo

Ukulingana

- tshatisa, thelekisa
- fana nqwa
- fana ne-, yahlukile kwi-
- yenza
- lingana ne
- amaqela alinganayo

Qikelela

- tshatisa, thelekisa
- qashisela ukuba zingaphi; qikelela
- kufutshane, kufutshane ne-
- phantse zisondelelene
- ngaphantsi nje, ngaphezulu nje
- ninzi kakhulu, mbalwa kakhulu, zanele, azanelanga

IiPateni, iiFanshini neAljibhra

Ipateni ifumaneka kuko konke okusingqongileyo. Abantwana bahlangabezana neepateni **nolandelelaniso** kwindlela abantu abaziphethe ngayo, kwiinkqubo zabo zemihla ngemihla, iintsuku zeveki, iinyanga zonyaka, kumjikelo wemozulu, kumculo nobugcisa, nakwiindawo abahlala kuzo. Umzekelo:

- iimpahla

Umfanekiso 54 Iipateni ezimpahleni

ULULHU LWEENKCAZELO

ipateni
ulandelelwano lwezinto njengesiqhelo, iintshukumo okanye iziganeko eziphindaphindeneyo ngendlela enokuxelwa kwangaphambili

ulandelelaniso
indlela ethile apho izinto, iintshukumo okanye iziganeko ezilandelelana ngayo

- buildings

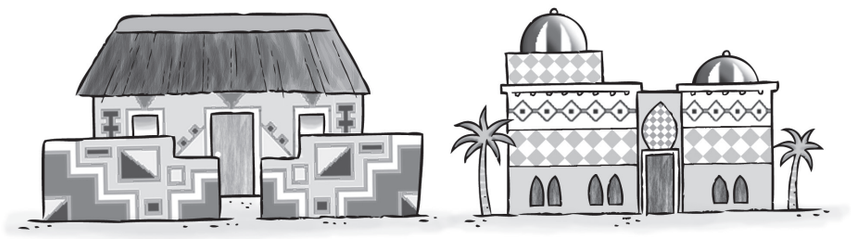


Figure 55 Patterns in buildings

- nature

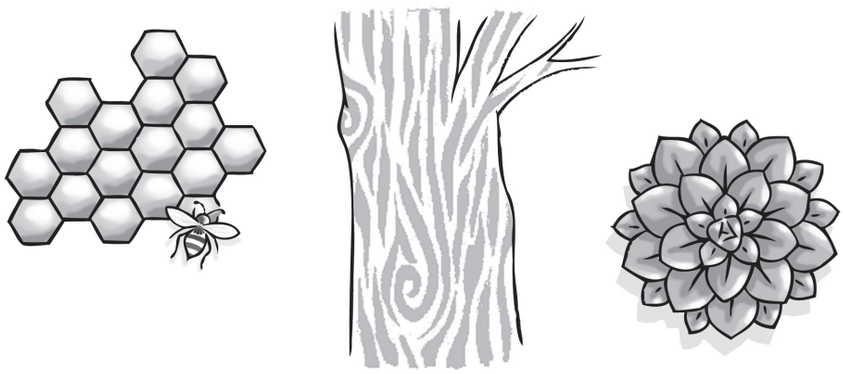


Figure 56 Patterns in nature

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.

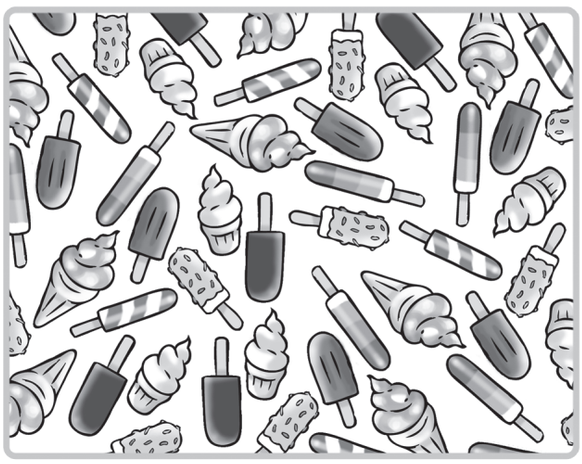
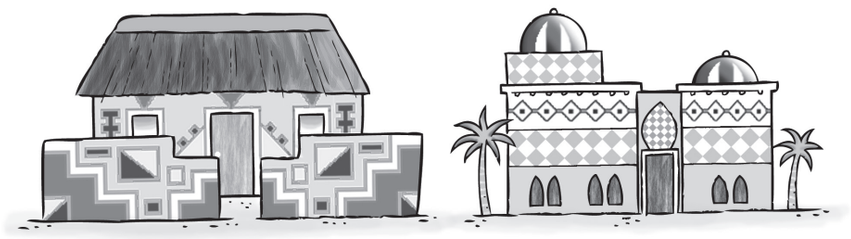


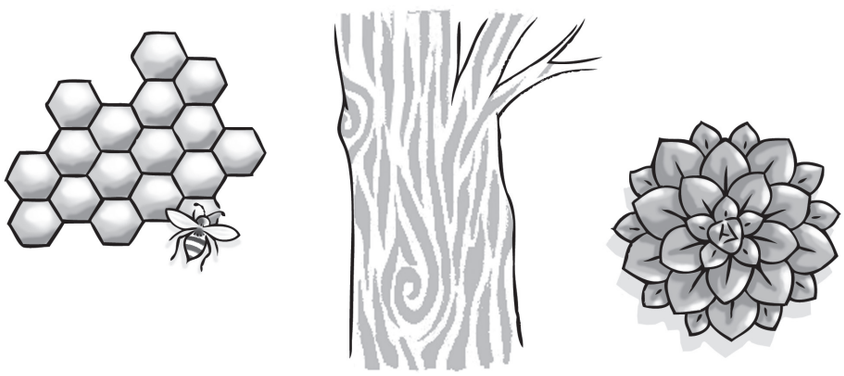
Figure 57 Irregular patterns

- izakhiwo



Umfanekiso 55 Iipateni kwizakhiwo

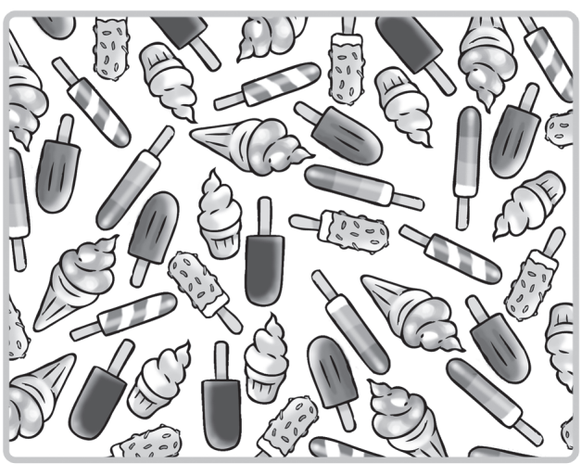
- kwindalo



Umfanekiso 56 Iipateni kwindalo

Ukuchonga iipateni

Abantwana abancinci bathanda ukugxila kumbala nomtsalane womfanekiso okanye wento, umz. intwana yephepha lokusongela, baze bathi line 'pateni entle'. Inkoliso yezi pateni **ziipateni ezingaqhelekanga**. Siyabona ukuba kukho uphindaphindo lwezinto, imibala okanye iimilo kodwa asinakutsho ukuba olu phindaphindo lusebenza njani.



Umfanekiso 57 Iipateni ezingalandelelaniyo

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

Ootitshala kufuneka batsalele umdla wabafundi kwiipateni ezingaphakathi nezingaphandle kweklasi. Umzekelo, khomba indlela ezicwangciswe ngayo izitena eludongeni, ithayile kwindledlana eyenziweyo ecaleni lendlela okanye iimpawu kwizilwanyana.

Umfanekiso 58 Iipateni ezisingqongileyo

Kwi**pateni elandelelanayo** siyakwazi ukubona indlela **amalungu** kwipateni aphindaphindiwe ngayo kwaye sinako ukuqikelela ulandelelwano okanye ulandelelwaniso oluzakulandelwa yipateni, umz. kwipateni engezantsi siyakwazi ukubona ukuba isangqa nesikwere ziphindaphindiwe kwaye singaqikelela ukuba imilo elandelayo kulandelelwano izakuba sisangqa, silandelwe sisikwere, njalonjalo.

ULULHU LWEENKCAZELO

amalungu
izinto, iintshukumo okanye iziganeko kwipateni

Umfanekiso 59 Ipateni yesikwere nesangqa

KwiBanga R, abafundi bangakwazi ukuqaphela ipateni kodwa basenokungakwazi ukuyichonga okanye bachaze ukuba 'yintoni eyenza ipateni'. Ootitshala bangabanceda abafundi bachonge iipateni ngokubuza ukuba yintoni eyenza indlela ethile yepateni nokuba amalungu alandelelaniswe njani. Umzekelo ipateni engasentla: 'Yeyiphi imilo yokuqala? Yeyiphi imilo elandelayo? Ucinga ukuba yeyiphi imilo eza kulandela?'

Iintlobo ezahlukileyo zeepateni

Iipateni zejiyometri

Ipateni yejiyometri yipateni eyenziwe ngemigca kunye neemilo zejiyometri ezicwangciswe ngendlela elandelelanayo, umzekelo irombasi, uxande, isikwere okanye ipentagoni. Iipateni zejiyometri zingafumaneka kokusingqongileyo, umz. kwithayile zomgangatho nakwiphepha lokusonga.

Umfanekiso 60 Iipateni zejiyometri

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.

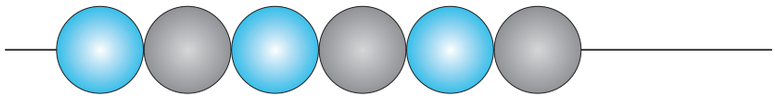


Figure 61 AB pattern

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

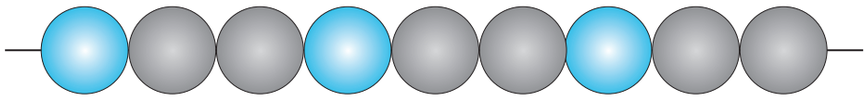


Figure 62 ABB pattern

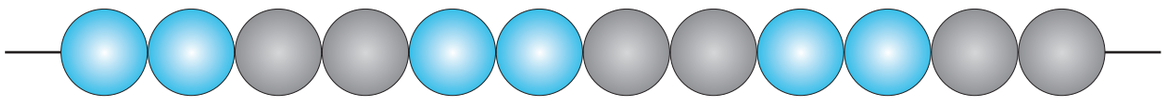


Figure 63 AABB pattern

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

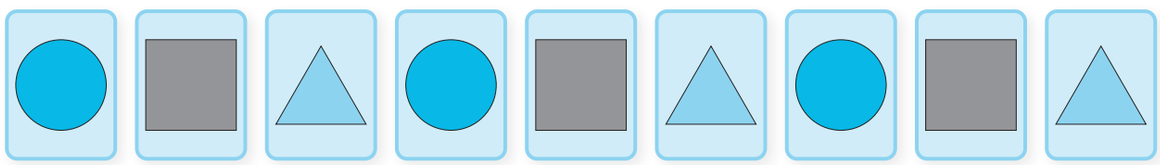


Figure 64 ABC pattern

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.

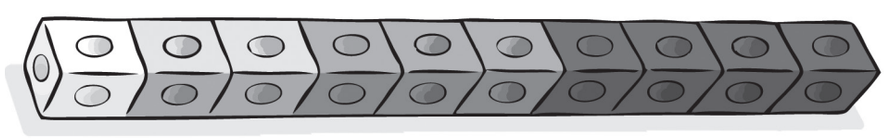
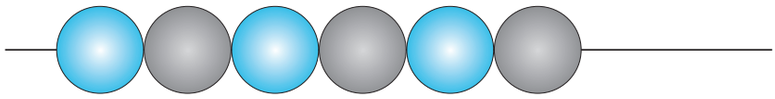


Figure 65 Growing pattern

Iipateni eziphindaphindayo

Iipateni eziphindaphindayo zenziwe ngolandelelwano oluphindiweyo lwamalungu, umzekelo iimilo, imibala, izandi, izinto, iintshukumo okanye iziganeko. Kwipateni ephindayo, amalungu afanayo aphindwa rhoqo.



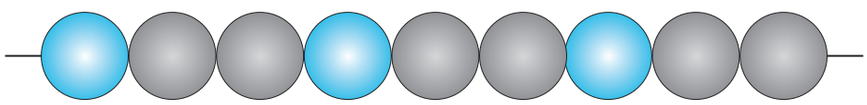
Umfanekiso 61 Ipateni AB

Qala ngokwazisa abafundi iipateni ngokusebenzisa **uphawu (iathribhyuthi)** olunye kuphela olwahlukileyo, umz. umbala okanye imilo, kwaye unike ulandelelwano olude ngokwaneleyo ukuze abafundi bakwazi ukuyiqonda ipateni.

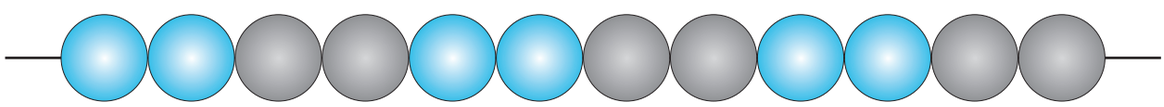
Abafundi bangwakwazi ke ngoko ukuqaphela iipateni ezinobunzima, ezifana noABB okanye uAABB.

ULUHLU LWEENKCAZELO

uphawu (iathribhyuthi)
imbonakalo okanye uphawu lwento, umzekelo, umbala okanye imilo

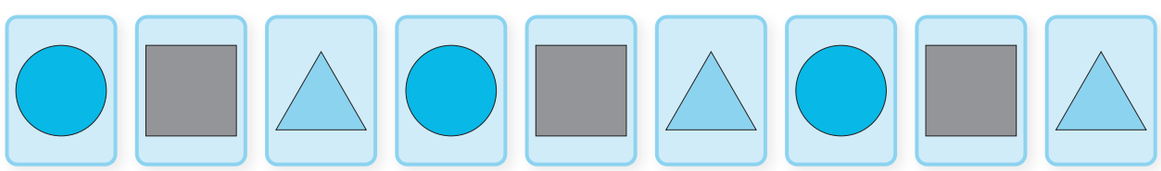


Umfanekiso 62 Ipateni ABB



Umfanekiso 63 Ipateni AABB

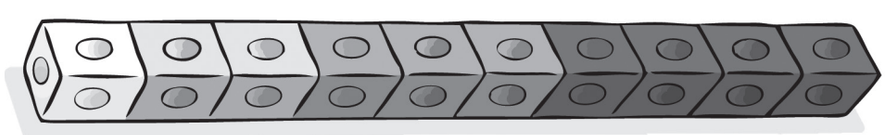
Ngokuthe chu yazisa abafundi iipateni ezineempawu ezimbini okanye ngaphezulu, ezinje ngombala nemilo.



Umfanekiso 64 Ipateni ABC

Iipateni ezikhulayo

Iipateni ezikhulayo zahlukile kwiipateni eziphindaphindayo ngokuba ipateni iyakhula okanye iyancipha ngokobukhulu kulandelelwano. Kwipateni ekumfanekiso 65, inani leebhloko ezinombala linyuka ngonye kulandelelwano ngalunye lweebhloko.



Umfanekiso 65 Ipateni ekhulayo

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

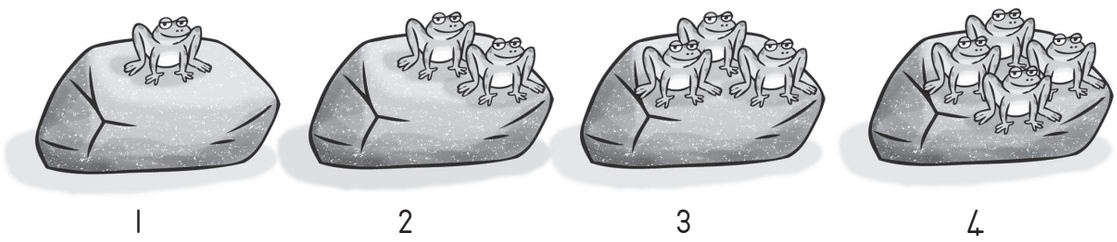


Figure 66 Growing pattern

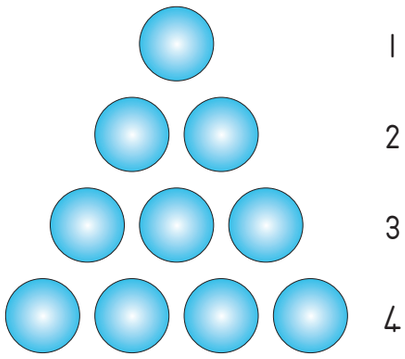


Figure 67 Growing pattern

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

Figure 68 Growing pattern

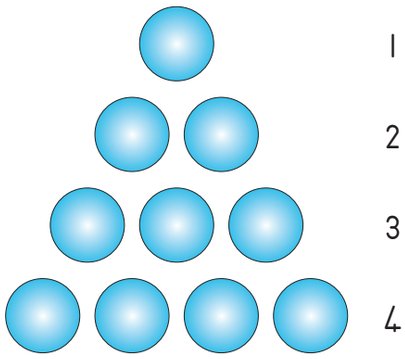
Patterning skills – what learners need to know

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

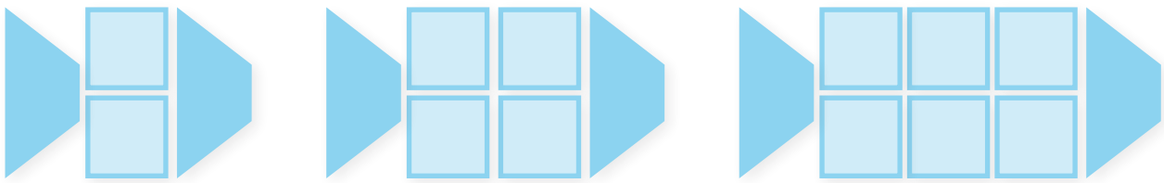
Abafundi basenoku nxulumanisa ipateni nokulandelelana kwamanani kwaye baqaphele ukuba inani linyuka ngonye ngalo lonke ixesha.

Umfanekiso 66 Ipatheni ekhulayo



Umfanekiso 67 Ipateni ekhulayo

Kule pateni ingezantsi, ulandelelwano lukhula ngombini ngalo lonke ixesha.



Umfanekiso 68 Ipateni ekhulayo

Izakhono zokwenza ipateni – oko kufuneka abantwana bekwazile

Izakhono zabafundi ziya kwahluka kodwa ngokubanzi abafundi beBanga R basebenzela ukuba bakwazi uku:

- tshatisa nokuhlela izinto ngokophawu olunye nangaphezulu, umzekelo, imilo, umbala, isandi
- thelekisa ukufana nomahluko kwizinto ezimbini nangaphezulu
- thetha ngeepateni ezifunyanwa kumava emihla ngemihla
- qaphela iipateni ezikwindalo, umz. ipali yocingo, izitena, kumgangatho wezitena
- chonga iipateni
- khuphela iipateni ezenziwe ngabanye
- andisa iipateni eziqalwe ngabanye

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

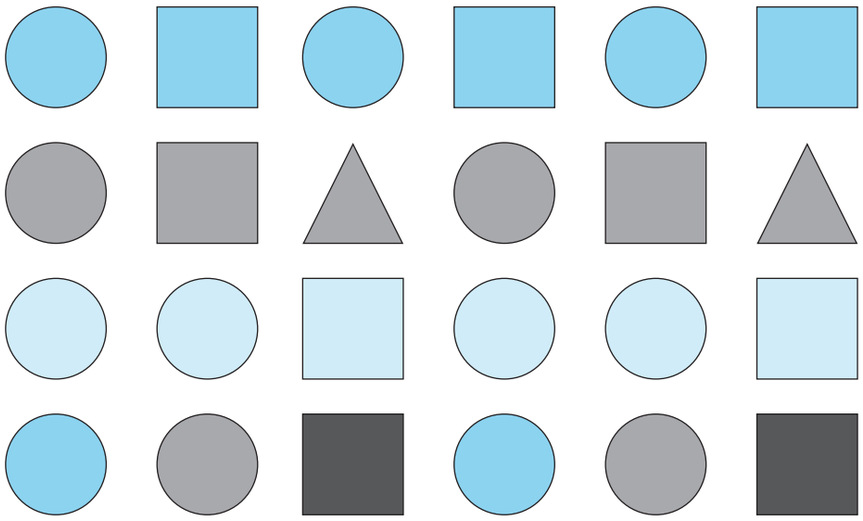


Figure 69 Creating patterns

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

In practice ...

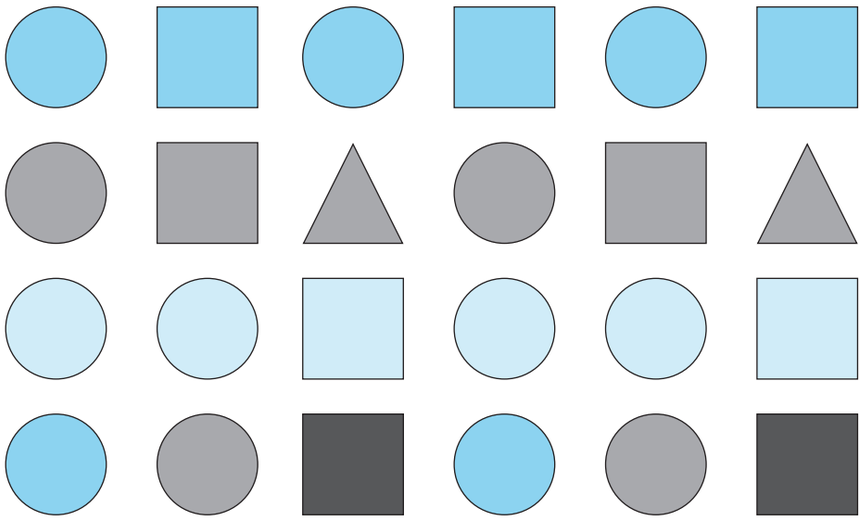
Teachers should guide learners to recognise and make patterns and provide opportunities for them to observe, describe and discuss patterns, focusing on activities that involve:

- 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?

- dala ezabo iipateni kumanqanaba ahlukeneyo obunzima afana ne:



Umfanekiso 69 Ukwenza iipateni

- xela ukuba yintoni engekhoyo xa inxalenye yepateni ifihliwe.

Ukuziqhelisa ...

Ootitshala kufuneka bakhokele abafundi ukuba baqaphele kwaye benze iipateni kwaye babonelele ngamathuba okuba bajongisise, bachaze kwaye baxoxe ngeepateni, begxile kwimisebenzi equka:

- ukuthetha ngokuba 'yintoni eyenza ipateni'
- ukuhlola iipateni besebenzisa izinto, imifanekiso kunye nesingqi, esifana nokuqhwaba, ngexesha lokugxila kwimathematika ngokunjalo nakumsebenzi wobugcisa, umculo kunye nemisebenzi yomzimba yaphandle
- ukwenza ezabo iipateni kwaye bethetha ngokuba alandelelaniswa njani amalungu ngendlela ethile kwaye kuba kutheni
- ukuzoba iipateni nokusebenzisa imibala neemilo ezahlukileyo, yaye bathethe ngendlela ipateni ephindaphindwe ngayo.

Imibuzo enokubuzwa ngeePateni, iiFanshini neAljibhra

- Uyayibona ipateni? Ndixelele ngayo.
- Yintoni eza kuqala, ekugqibeleni, elandelayo, emva, phambi?
- Ingaba ezi pateni zimbini ziyafana? Yintoni umahluko? Ungenza njani ukuze zifane?
- Ngaba ungayikopa le pateni? Yintoni ezakulandela kule pateni?
- Yintoni endimele ukuyenza ukuze ndandise le pateni?
- Ungandichazela ukuba ingantoni ipateni yakho? Ungayenza ipateni eyahlukileyo? Yintoni engekhoyo kule pateni?

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

Isigama seePateni, iiFanshini neAljibhra

- tshatisa, thelekisa, landelelanisa, ulandelelwano
- qala, ekuqaleni
- kuqala, phakathi, ekugqibeleni
- phambi, emva, ekugqibeleni
- yintoni elandelayo …?
- ubungakanani
- inkulu, inkudlwana, inkulu kunazo zonke
- incinci, incinci kune-, incinci kunazo zonke
- ziyafana, zahlukile, umahluko
- amagama emibala
- yakha ipateni
- ukuqaphela
- bonisa, chonga
- qhubeka, qhubekeka, yandisa
- khuphela
- phinda, kwakhona
- chaza, cacisa
- yintoni eza phambi/emva?
- elandelayo, phakathi
- emgceni, kuluhlu
- isithuba, isithuba esivulekileyo

IsiThuba neMilo (iJiyometri)

Abantwana abancinci baphonononga isithuba nemilo kunye nesithuba ngexesha lemisebenzi yabo yemihla ngemihla njengoko bezama ukwenza intsingiselo yento eyakhiweyo neemilo ezibangqongileyo, ezifana nobuso boomama babo, izinto ezihambayo kunye nemizimba yabo. Baphonononga iikhonsepthi zesithuba ezinxulumene nemilo nesithuba xa bedlala ngeebhola okanye bengena bephuma kwiibhokisi, bakhwele okanye bangene ngaphantsi kwezinto. Baqaphele iimilo ezahlukeneyo kwizinto ezisemakhayeni abo naphandle, ezinjengamafu, izakhiwo, amagqabi nezithuthi.

Abantwana abaninzi bafika kwiBanga R benolwazi lweemilo ezahlukeneyo kwaye bekwazi ukuchonga baze bazobe iimilo ezinjenge zangqa noonxantathu. Bangadlala nangeebhloko, izinto zokudlala zokwakha neephazili. KwiBanga R, abafundi bakha phezu kwala mava njengoko befunda ngesithuba, imilo, indawo, **ulungelelwaniso** lwemilo, imbonakalo kunye nesalathiso. Badinga amathuba amaninzi okuphanda nokuphicotha izinto ezahlukeneyo imihla ngemihla. La mava wesithuba nemilo anceda ukukwakha isiseko esiluqilima ekuqondeni **ijiyometri** kumabanga alandelayo.

ULUHLU LWEENKCAZELO

ulungelelwaniso
indlela izinto ezibekwe ngayo ngokunxibeleleneyo enye kwenye

ijiyometri
ibakala lemathematika elijongene neempawu, imilinganiselo nolwalamano kwiikona, imigca kunye neekona zemilo kwisithuba

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.

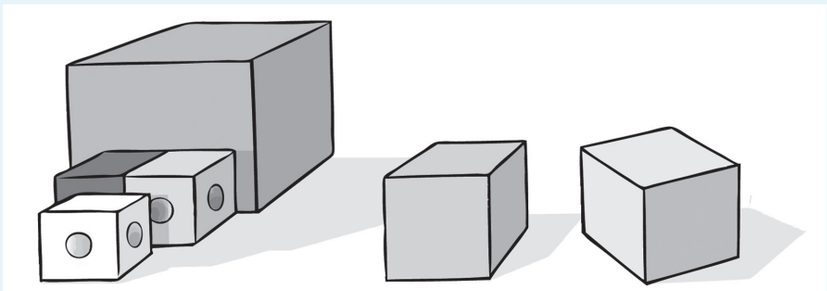


Figure 70 Exploring position

Isithuba

Abantwana baziqhelanisa ngokwabo nesithuba besebenzisa imizimba yabo. Kuqala bahlola ubudlelwane phakathi kwabo, abanye abantu kunye nezinto. Iintsana zifikelela kwaye zitsale izinto ezikufutshane nazo, zize ziqalise ngokuthe chu ukuhambahamba ziphononononga iindawo ezihlala kuzo zisebenzisa izivo zazo. Ziphononononga okwenzekayo xa zityhala, zitsala, ziqengqelekisa okanye zijika izinto ezahlukeneyo ngelixa zidlala ngazo, kwaye xa zisenza oku zikhulisa ukuqonda kwazo ngokunxulumene kwizinto. Zifunda kwakhona umda wentshukumo yazo ngokwasemzimbeni njengoko zikhwela ngaphaya nangaphantsi kwezitulo, kwiibhokisi, zizifihla emva kwemithi okanye zijonge phantsi kumanyathelo.

Indawo

Indawo kwiBanga R iqala ngendawo yezinto ngokunxulumene nomfundi, kwaye ikhule ibonise inkqubela kwindawo yezinto ngokunxulumene kwezinye izinto. Isigama sendawo siquka uphakathi, phezu, ngaphezu, phambi kwe-, emva, phakathi, ecaleni kwe-, njalonjalo.

Ngoncedo lwabantu abadala ekhaya kunye nasesikolweni nootitshala, abafundi beBanga R bangakwazi ukuphuhlisa isigama ukuchaza isithuba, indawo kunye nesalathiso xa bedlala, bekhangela izinto okanye begwencela phezu kwezinto.

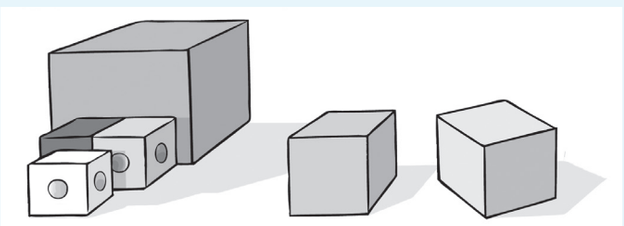
Ukuziqhelisa ...

Maninzi amathuba ngexesha lasemini abafundi abanokucinga ngokwesithuba kwaye basebenzise isigama sendawo:

- kwimidlalo
- xa beqokelelwa izinto ngexesha lokucoca
- xa besima ngomgca
- xa bethetha ngokuba ziphi izinto emifanekisweni nasemabalini.

Ukuvumela abafundi ukuba baphicothe iintshukumo zabo:

- yenza umqobo ngaphakathi okanye ngaphandle usebenzisa izitulo, amavili, iibhokisi kunye/okanye namaplanga
- dlala umdlalo wamabali besebenzisa isigama semathematika ngendawo, umz. ngaphezulu nangaphantsi, phezulu naphantsi, kufuphi nakude, ecaleni naphakathi
- beka izinto kulungelelwaniso kunye neendawo ezahlukeneyo nolungelelwaniso
- cela abafundi ukuba bajonge izinto kwiindawo ezahlukeneyo (kwimbonakalo) baze batsho ukuba babona ntoni na.



Umfanekiso 70 Ukuphononononga indawo

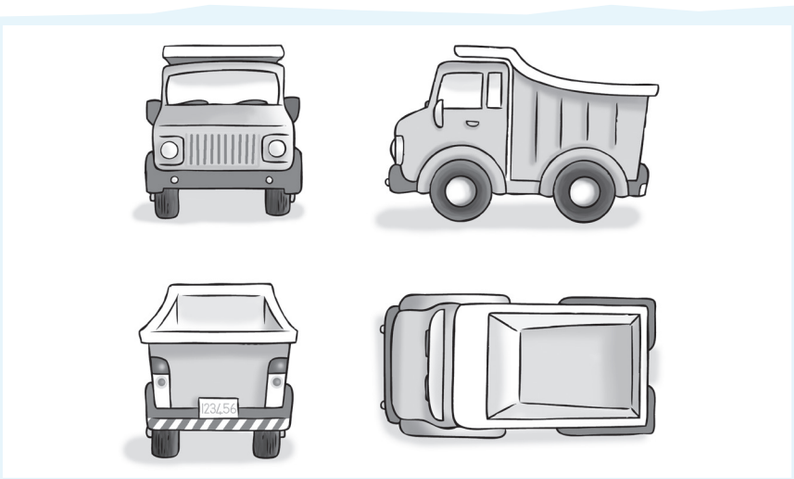


Figure 71 Different orientations

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

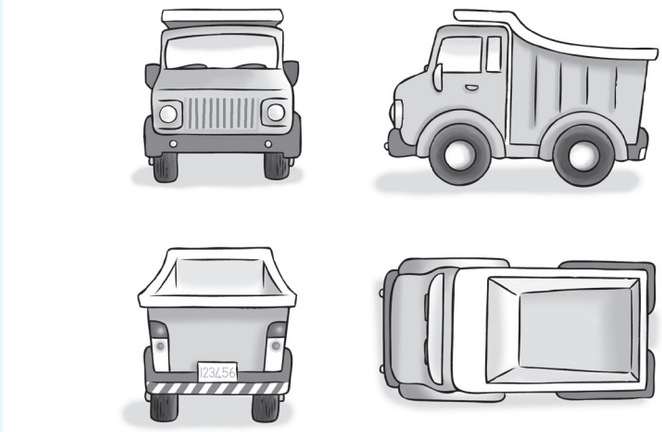
In Grade R, as learners' gain an increased understanding that when things are far away they look smaller, their concept of **perspective** develops.

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



Umfanekiso 71 Ulungelelwaniso olwahlukeneyo

Isalathiso

Abafundi beBanga R ekuqaleni baqala babonise isalathiso ngokukhomba, emva koko basebenzise amabinzana alula anjengo 'ngaphaya'. Ikhonsepthi yesalathiso ibonisa inkqubela ukusuka ekubeni malunga nendawo abantwana abakuyo ngokunxulumene nezinye izinto, umz. hamba ngqo, jika, njalonjalo.

Ukuziqhelisa ...

Sebenzisa isigama sesalathiso:

- ngexesha lokutya kunye nelokucoca
- xa unika imiyalelo emalunga nalapho kubekwa khona izinto kunye nokufumana ukuba ufika njani kwenye indawo usuka kwenye
- xa kuphunywa kusiyiwa kwiindawo.

Umbono

KwiBanga R, njengoko abafundi befumana ukuqonda okwandileyo kokuba xa izinto zikude zijongeka zincinci, ikhonsepthi **yombono** iyakhula.

ULUHLU LWEENKCAZELO

umbono
ifuthe lomgama okanye lobunzulu kwimbonakalo yezinto

Ukuziqhelisa ...

- Qwalasela abantu nezinto ngaphandle kweklasi ukuze uthethe ngokuba kutheni zijongeka zincinci.
- Vala iliso elinye ulinganise ubukhulu bomntu okanye inkangeleko yento wandule uthethe ngokuba ngokwenene zincinci kangangoko na.
- Nika ingqalelo kwizinto ezisemifanekisweni ezibonakala zincinci uze uthethe ngokuba kutheni zinjalo.

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

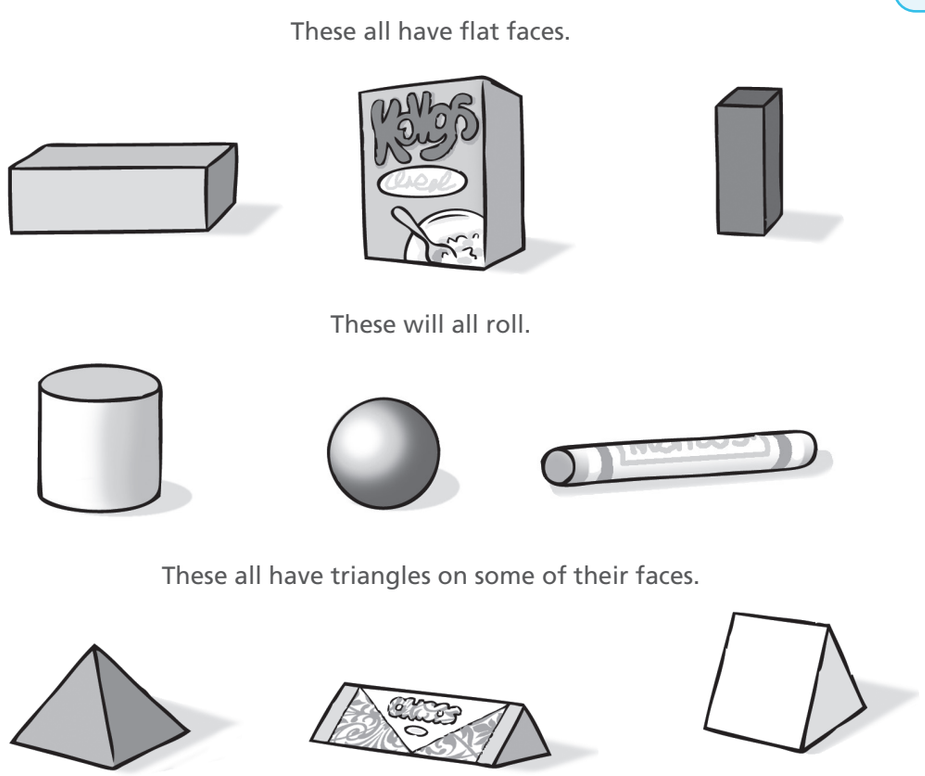


Figure 72 3-D objects

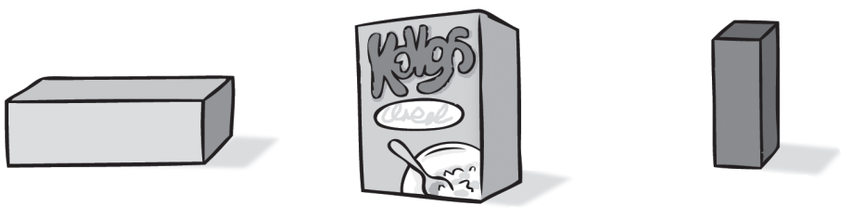
Imilo

KwiBanga R, abafundi bagxila ekuqapheleni, ekuchongeni nasekuxeleni iimilo **ezineenkangeleko ezintathu (3-D)** kunye neemilo **ezineenkangeleko ezimbini (2-D)**. Kulwimi lwemihla ngemihla, abafundi baya kutsho ukuba bangayijonga into kumacala onke, phezulu kunye nasezantsi. NgokweMathematika sichaza **iimpawu** zezinto ezinokwakheka oku3-D ngokobude, ububanzi kunye nokuphakama. Kulwimi lwemihla ngemihla, abafundi bayakuthetha ngeemilo ezingu2-D njengemifanekiso, kodwa ngokweMathematika sithetha ngeemilo njengezino bude nobubanzi ukuchaza ukwakheka okubini.

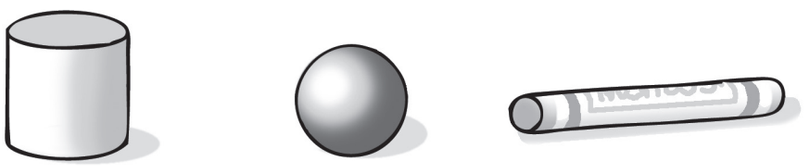
Izinto ezineenkangeleko ezintathu (3-D)

KwiBanga R, abafundi baphonononga iimpawu zemihla ngemihla zezinto ezinenkangeleko engu3-D zemihla ngemihla. Bakha izakhiwo besebenzisa izinto zasekhaya ezinokuphinda zisetyenziswe ezifana neebhokisi, iinkonkxa, izitya, iiroli zamaphepha angasese kunye neebhola. Bayaphanda baze bachaze izinto eziyibhokisi neziyibhola. Bathelekisa baze bahlele izinto, kwaye bathethe ngokufana kunye nokwahluka kwazo.

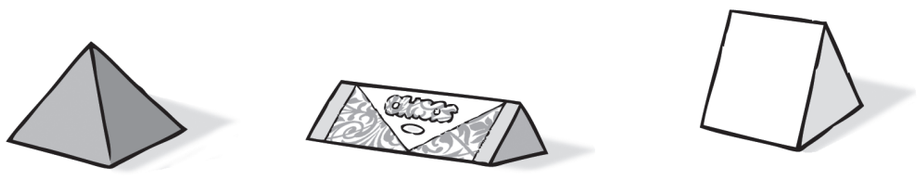
Zonke ezi zinobuso obumcaba.



Zonke ezi ziza kuqengqeleka.



Zonke ezi zinoonxantathu kobunye ubuso bazo.



ULUHLU LWEENKCAZELO

neenkangeleko ezimbini (2-D)
imilo eneenkangeleko ezimbini: ubude nobubanzi

neenkangeleko ezintathu (3-D)
into eneenkangeleko ezintathu: ubude, ububanzi nokuphakama

iimpawu
iimpawu zemilo zika2-D okanye zezinto ezingu3-D, umz. ubude, ububanzi, ukuphakama, amacala (ubuso), imiphetho neekona

Umfanekiso 72 Izinto ezineenkangeleko ka3-D

In practice ...

Learners can:

- Play with collections of 3-D objects including blocks, tins, boxes and balls.
- Describe objects. They can choose one object at a time. You can prompt their thinking through questioning, and introduce them to the correct names and properties of each object.
- Sort 3-D objects according to a particular property, such as straight edges or whether they can roll. This will allow learners to become familiar with, and to explore the properties of the objects.
- Describe these objects using everyday language, such as flat, smooth, pointy. As learners notice more properties they learn the appropriate names, e.g. edge, corner, surface or base, face. Sorting activities and discussions about objects are important because they help learners to understand, for example, that although a cardboard tube is tall and thin, while a drink can is much shorter, they are both cylinders.

Learners should be guided to recognise that it is the property of an object, such as the length, breadth or height, that we are focusing on when sorting and not the colour, size or other features.

Grade R learners may ask what the name of an object is, e.g. a cube, cylinder or cone. In higher grades learners learn about the 3-D solids shown in Figure 73.

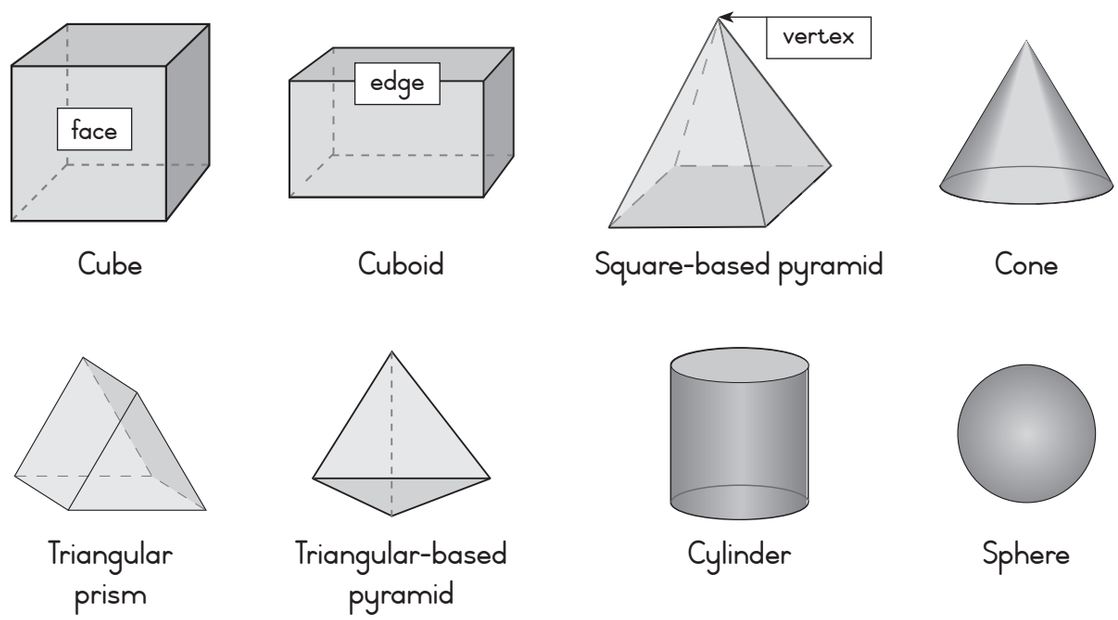


Figure 73 3-D solids

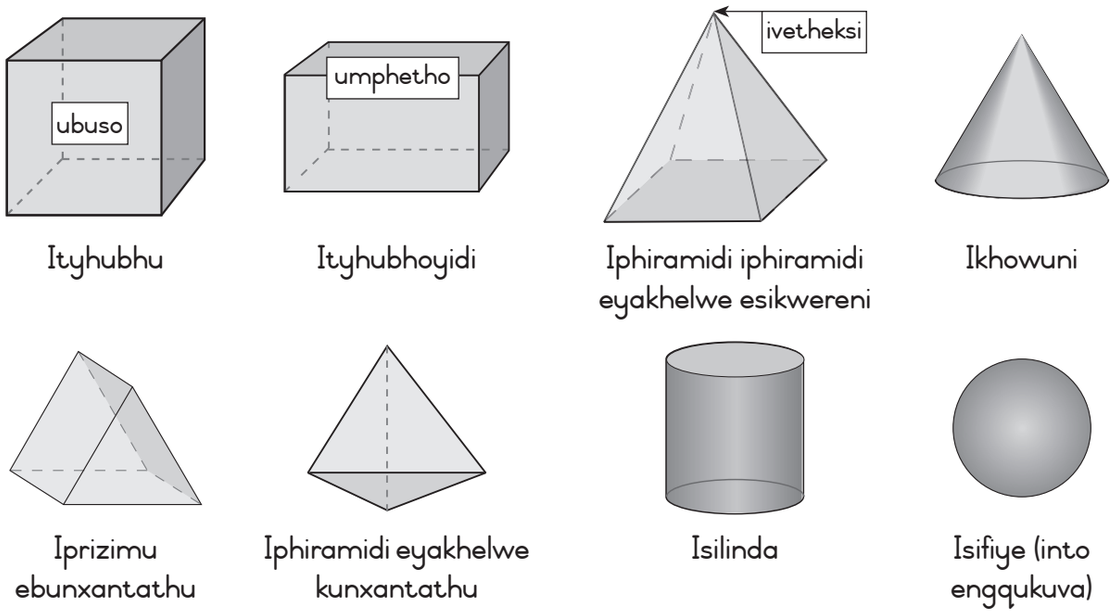
Ukuziqhelisa ...

Abafundi banoku:

- Dlala ngengqokelela yezinto ezingu3-D eziquka iibhloko, iinkonkxa, iibhokisi kunye neebhola.
- Chaza izinto. Banokukhetha into ibenye ngexesha. Ungakwazi ukuncedisa ukucinga kwabo ngokubuza kwaye ubazise amagama achanekileyo neempawu zento nganye.
- Hlela izinto ezingu3-D ngokophawu oluthile, elinjengemiphetho engqalileyo okanye ukuba zingaqengqeleka na. Oku kuya kuvumela abafundi ukuba babe nokuziqhela, kwaye baphonononge iimpawu zezinto.
- Chaza ezi zinto besebenzisa ulwimi lwemihla ngemihla olufana nomcaba, isulungekile, inobutsolo. Njengokuba abafundi beya beqhaphela iimpawu bafunda amagama afanelekileyo, umz. umphetho, ikona, umphezulu okanye umzantsi, ubuso. Ukuhlela imisebenzi kunye neengxoxo ngezinto kubalulekile kuba kunceda abafundi ukuba baqonde, umzekelo, nangona ityhubhu yekhadibhodi inde kwaye inciphile, netoti yesiselo imfutshane, zombini ziisilinda.

Abafundi kufuneka bakhokelwe ukuqaphela ukuba luphawu lwento, olunje ngobude, ububanzi okanye ubunzulu, ekugxilwa kulo xa kuhlelwa hayi umbala, ubukhulu okanye olunye uphawu.

Abafundi beBanga R banokubuza ukuba yintoni igama lento, umz. ityhubhu, isilinda okanye ikhowuni. Kumabanga aphezulu abafundi bafunda ngee3-D eziqinileyo eziboniswe kuMfanekiso 73.



Ityhubhu | Ityhubhoyidi | Iphiramidi iphiramidi eyakhelwe esikwereni | Ikhowuni

Iprizimu ebunxantathu | Iphiramidi eyakhelwe kunxantathu | Isilinda | Isifiye (into engqukuva)

Umfanekiso 73 Ii3-D eziqinileyo

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.

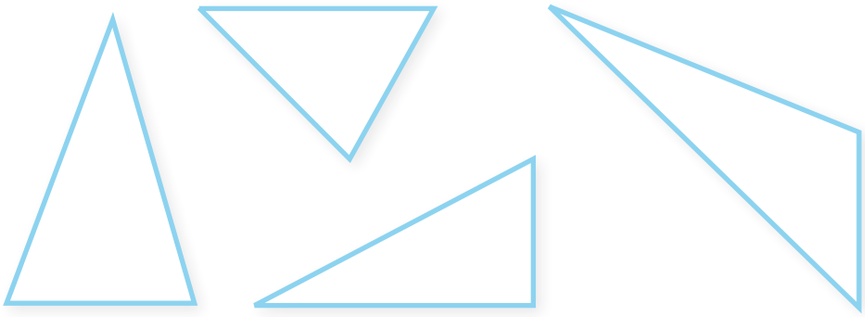


Figure 74 Shapes with three sides

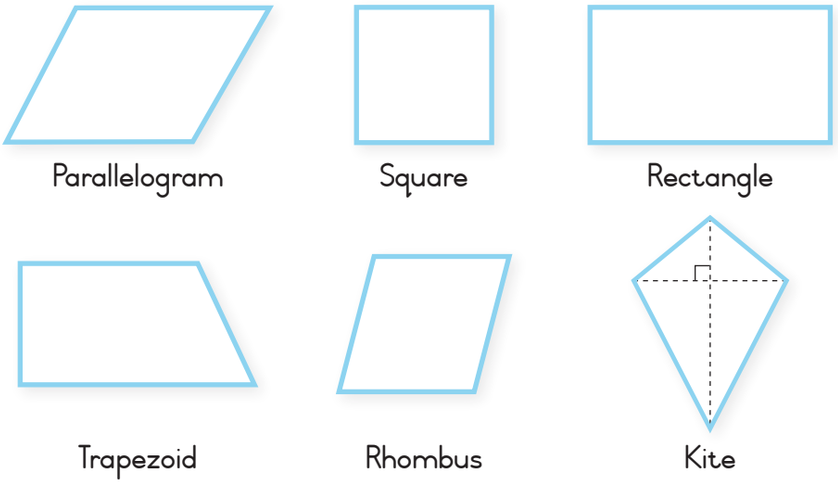


Figure 75 Shapes with four sides

Iimilo ezineenkangeleko ezimbini (2-D)

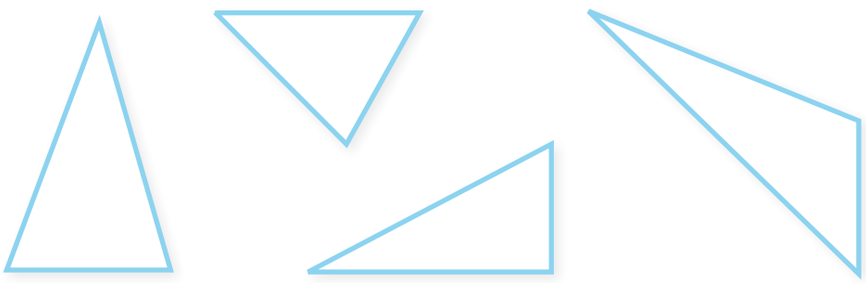
KwiBanga R, abafundi baqaphela, bachonge kwaye banike amagama eemilo ezingu2-D: izangqa, oonxantathu, izikwere kunye neengxande. Ngaphakathi nangaphandle kweklasi babona iimilo kwaye bangaziphononongа iimpawu zezi milo emifanekisweni baze bakhangele izinto 'ezifana' neemilo, umz. uphawu lwendlela lungajongeka njengesangqa, iglasi yefestile njengesikwere, umnyango njengoxande.

Ukuziqhelisa ...

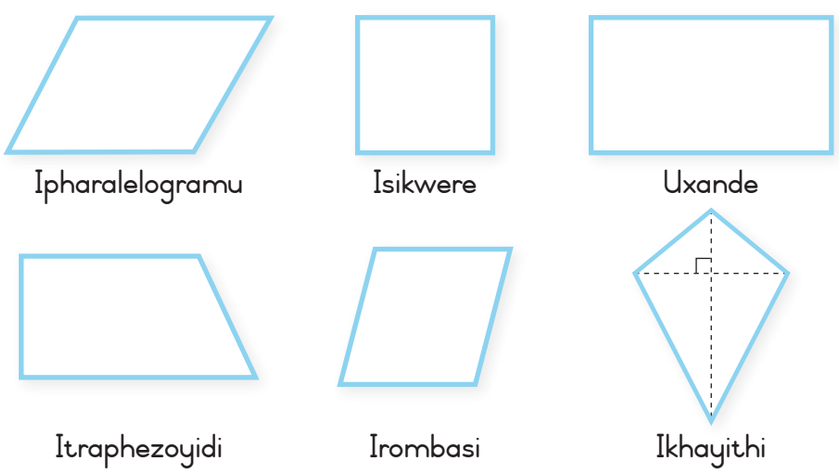
Abafundi banga:

- Phononongа iimpawu zeemilo ezinenkangeleko ka2-D ngaphakathi nangaphandle kweklasi, ezifana nezangqa, izikwere, ingxande kunye noonxantathu.
- Khangela izinto ezinemilo efana ne'sikwere', bebhekisele kwicala okanye ubuso bebhokisi okanye imilo 'esisangqa' bebhekisele kuphawu lwendlela okanye isiseko okanye umphetho wekomityi.
- Chaza iimilo ezinenkangeleko ka2-D ezohlukeneyo ngobukhulu kunye nolungelelwaniso kwimifanekiso.

Abafundi kufuneka bazibone iintlobo ngeentlobo zeemilo ezinenkangeleko ka2-D, umz. oonxantathu abohlukileyo (hayi nje abo balinganayo), iityhubhoyidi zobukhulu obahlukeneyo. Oku kunceda abafundi ukuba baqaphele ukuba zeziphi iimilo ezibufana, umzekelo, ukuba bonke oonxantathu banamacala amathathu kunye neekona ezintathu kodwa ibe inkangeleko ingafani, kwaye iingxande zinamacala amane akukhathaliseki nokuba zibekwe njani.



Umfanekiso 74 Iimilo ezinamacala amathathu



Umfanekiso 75 Iimilo ezinamacala amane

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.

Nika abafundi amathuba okuphonononga iimilo ezinenkangeleko ka2-D ngexesha lemisebenzi yokudlala ezimeleyo. Yenza iindidi zezixhobo zifumaneke – iimilo zeplastiki (iibhloko zeathribhyuthi) kunye neemilo zekhadibhodi ezinemibala nobukhulu obahlukeneyo – emva koko khuthaza abafundi bazisebenzise ukuyila iipateni, imifanekiso kunye nezinto zokuzimela ezilula. Ngexesha lale misebenzi, ootitshala bangaxoxa nabafundi ngento abayenzayo babuze nemibuzo efana nale: 'Ndixelele ngepateni oyenzayo.' 'Yindlu ethandekayo kakhulu le, uyenze njani? Chaza amanyathelo kwiqabane lakho.'

Xa abafundi beBanga R beqala ukuphanda nokuchaza iimilo nezinto, badla ngokusebenzisa ulwimi lwemihla ngemihla olufana nomcaba, igudile, inobutsolo. Ngokuthe chu ootitshala bangabanceda bafunde ukuba ukugxila kwiimigca yemilo okanye yento kwaye basebenzise isigama semathematika ukumela esemihla ngemihla – amacala, igobile, ngqalileyo, ikona.

Ukuqonda kwabafundi iimpawu zeemilo kuyakhula ngelixa bekwazi nokuqonda **iyantlukwano** ne**mfano** phakathi kweemilo. Oku kungenziwa ngokuhlela nokwahlula imisebenzi kwaneyokutshatisa efana nokuthatha isigqibo sokuba imilo iyahambelana na nephazili okanye isakhiwo, okanye ukudlala i*lotto* yeemilo.

Umfanekiso 76 Iiyantlukwano neemfano zeemilo

Ukuziqhelisa ...

Suka ku3-D uye ku2-D

Cinezela ujikeleze abafundi kunye nezinye izinto eklasini ukuze nibone kwaye nithethe 'ngomfanekiso' owenzekileyo. Abafundi bangankxuza izinto kwipeyinti bakugqiba bacinezele ephepheni ukwenza iiprinti. Kananjalo bangacinezela umphetho wezinto kwaye bathethe ngomgca nemilo abayenzayo. Izitya, iibhloko zokwakha, imiphakathi yeerolo zamaphepha angasese, phantse kanye nazo zonke izinto ezinokuphinda zisetyenziswe zingasetyenziswa ukwenza imifanekiso yeemilo ngale ndlela.

Imidlalo yemilo

Abafundi badlala ngababini. Umfundi omnye ufihla imilo okanye into emva kwakhe/emqolo aze omnye umfundi abuze imibuzo ngayo ade aqashisele ukuba yintoni na. 'Ingaba imcaba? Ingaba inamacala amathathu?'

Ootitshala bangacela umngeni kubafundi ukuba benze iimilo ezahlukileyo kangangoko kwijiyobhodi.

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?'

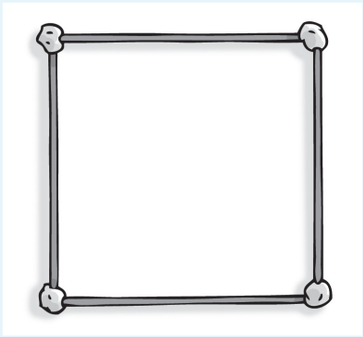


Figure 77 Building shapes

Construct shape pictures

Learners can use attribute blocks to create a picture.

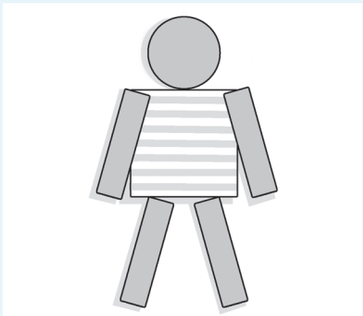


Figure 78 A shape picture

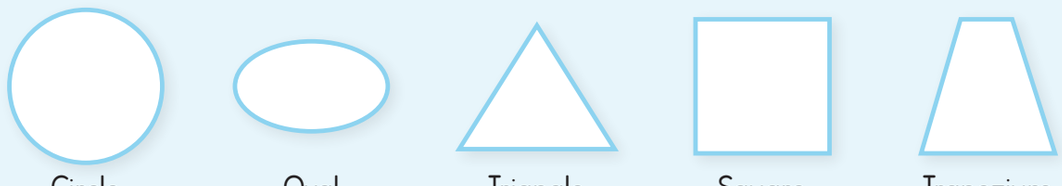
They can glue cut-out shapes onto paper to form other shapes or pictures.

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.

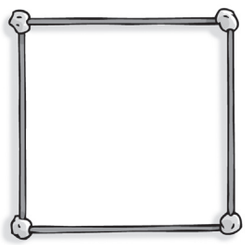
In higher grades learners will learn about a range of 2-D shapes. Learners in Grade R will often ask teachers and adults what a shape is called and the diagrams below provide a reference for these instances.



Yakha uphinde wahlukanise iimilo

Xa abafundi bekwazi ukuchonga iimilo ezinokwakheka kuka2-D (isikwere, isangqa, unxantathu, uxande) kunye nezinto ezinokwakheka kuka3-D (iibhokisi kunye neebhola), bakulungele ukwakha kwaye bahlukanise iimilo:

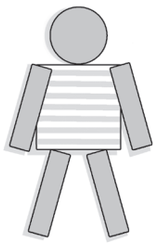
- Imicwe yokusela, izinti kunye nezinye izinto ezibufana nezi zingasetyenziswa nodongwe lokudlala ukwenza iimilo.
- Cela abafundi ukuba benze imilo kwaye baxoxe ngayo. 'Sisikwere eso. Ungasijika sibe ngunxantathu?'



Umfanekiso 77 Ukwakha iimilo

Yakha imifanekiso yeemilo

Abafundi bangasebenzisa iibhloko zeathribhyuthi ukwenza umfanekiso.



Umfanekiso 78 Umfanekiso weemilo

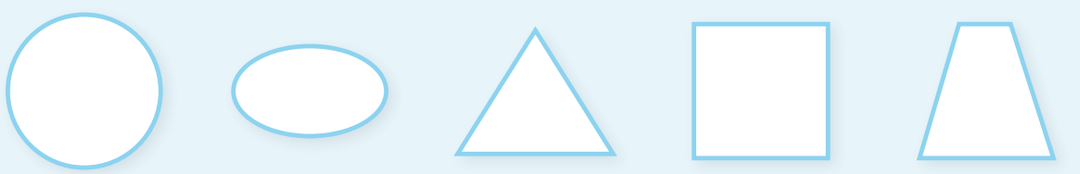
Bangancamathisela ngeglu iimilo ezisikiweyo ephepheni ukwakha ezinye iimilo okanye imifanekiso.

Bangaqengqa, batsale kwaye bacinezele udongwe lokudlala ukwenza iimilo kwaye bazidibanise ukwenza iimilo ezintsha.

Iinguquko

Abafundi batshibilizisa, baguqula kwaye bajike iimilo ngelixa besombulula iingxaki eziquka iimilo, ezinjengokutshatisa iimilo kwimifanekiso kunye nokukhuphela iipateni zeemilo besebenzisa iibhloko zeathribhyuthi.

Kumabanga aphezulu abafundi bayakufunda ngoluhlu lwemiilo ezinokwakheka kuka2-D. Abafundi kwiBanga R badla ngokubuza ootitshala kunye nabantu abadala ukuba ibizwa ngokuba yintoni imilo kwaye imifanekiso engezantsi inika ingxelo ngezi meko.



Isangqa Umbhoxo Unxantathu Isikwere Itrapheziyamu

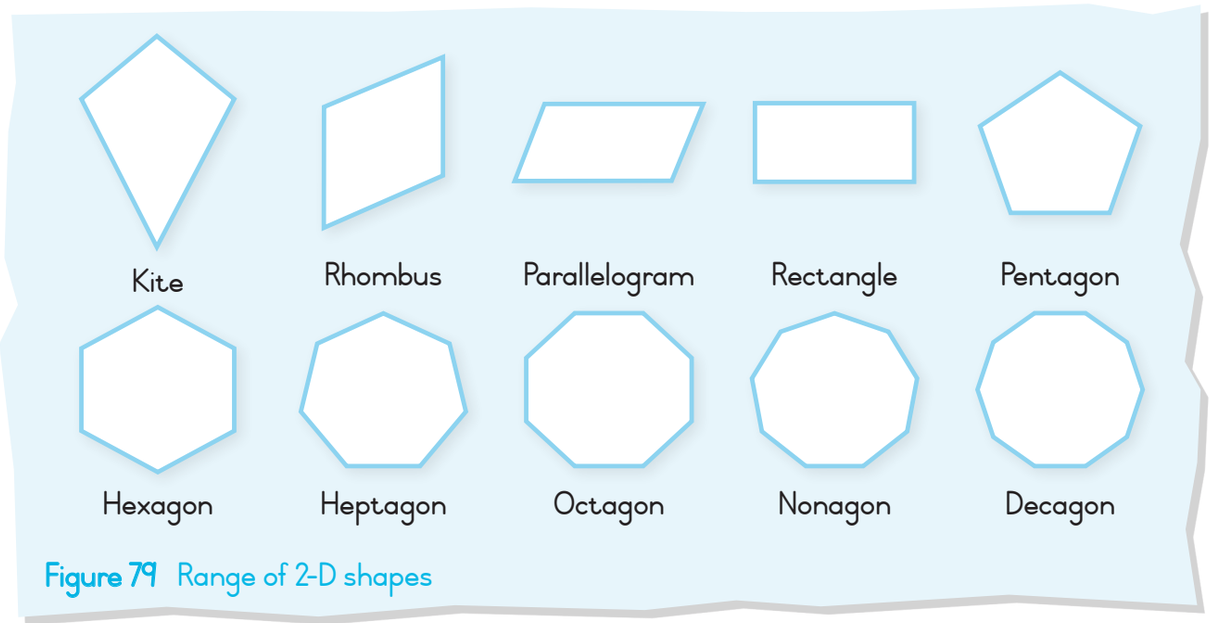


Figure 79 Range of 2-D shapes

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.

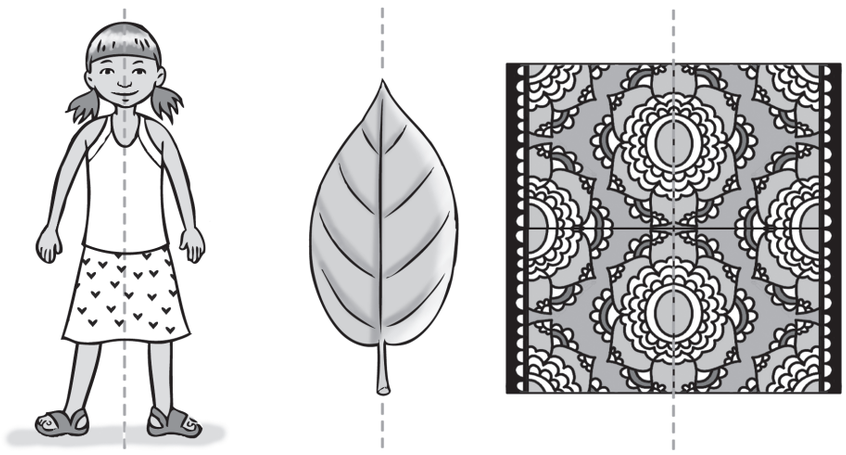
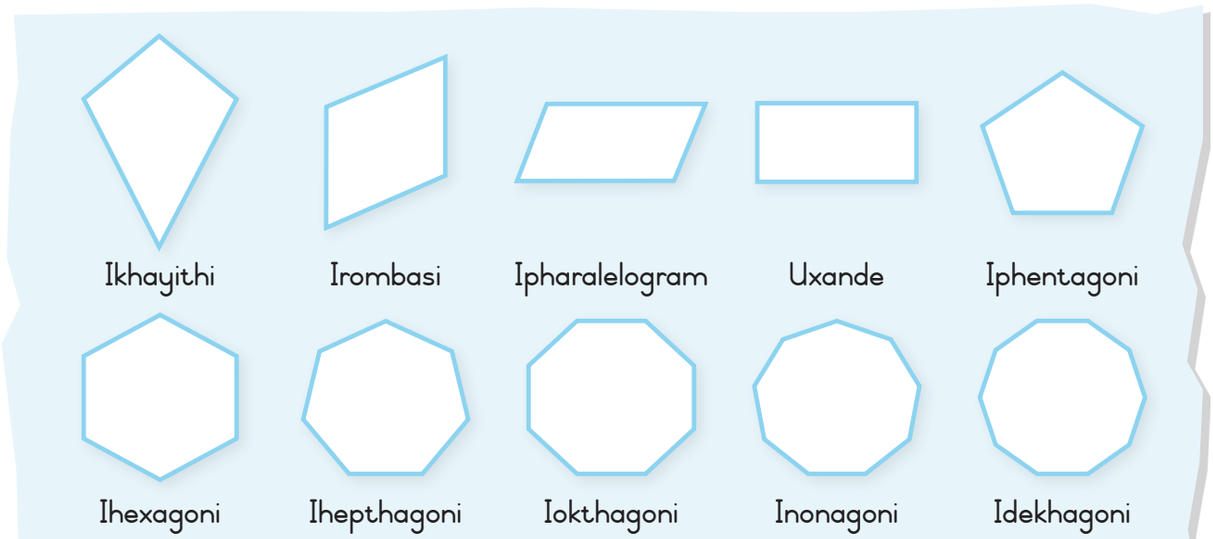


Figure 80 Line symmetry divides the shape into two identical parts.

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.



Umfanekiso 79 Uluhlu lweemilo ezinenkangeleko ka2-D

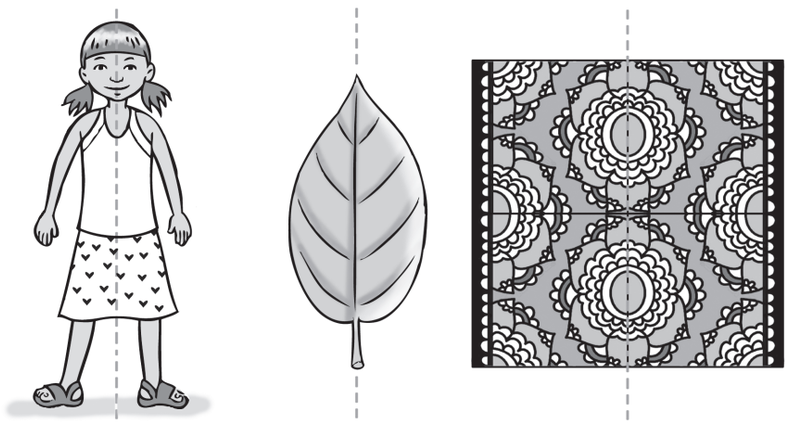
Isimetri (Ulingano-macala)

Abafundi banokuqaphela iipateni zolingano-macala ezibangqongileyo, kwindalo, kwizakhiwo, kwimifanekiso kunye nakwizinto. Kwiminyaka yakuqala, **isimetri (ulingano-macala)** lwaluqondwa lula lusaziwa njengokuba 'sisibuko' okanye 'isipili'. Abafundi bangaphononongа le khonsepthi ngokusonga kwaye basike iimilo kunye nemifanekiso ehafini, okanye ngokuzoba umfanekiso kwenye ihafu yephetshana besebenzisa iikhrayoni zamafutha, bandule ukusonga iphepha kwaye balihlikihle kwindawo engemva komzobo kwaye babone ikopi efana nqwa naleyo abayizobileyo kwenye ihafu yephepha.

ULUHLU LWEENKCAZELO

isimetri (ulingano-macala) xa imilo okanye into inokohlulwa ibe ziziqingatha ezibini ezilinganayo kumgca ophakathi

Iipateni zesimetri zifumaneka kwimizimba yethu, kwindalo, kwindawo eyakhiweyo kunye nakwimifanekiso. Umgca wesimetri wohlula imilo ibe ngamacala amabini afanayo. Umgca ungaxwesa okanye ume nkqo.



Umfanekiso 80 Umgca wesimetri wohlula imilo ibe ngamacala amabini afanayo

KwiBanga R, abafundi baphononongа isimetri ngokuthelekisa izinto kunye nemifanekiso. Bafunda ukuba isimetri ayikho malunga 'nokufana ne' kodwa ngokufana twatse, umzekelo ibhabhathane lilingana macala kodwa isandla asikho njalo.

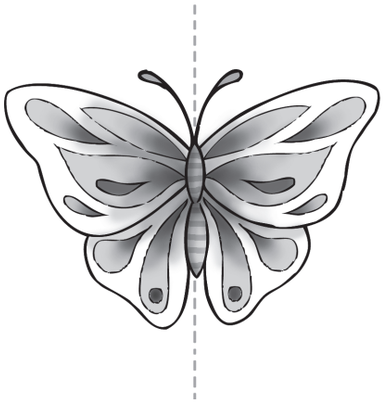


Figure 81 Symmetrical

Figure 82 Not symmetrical

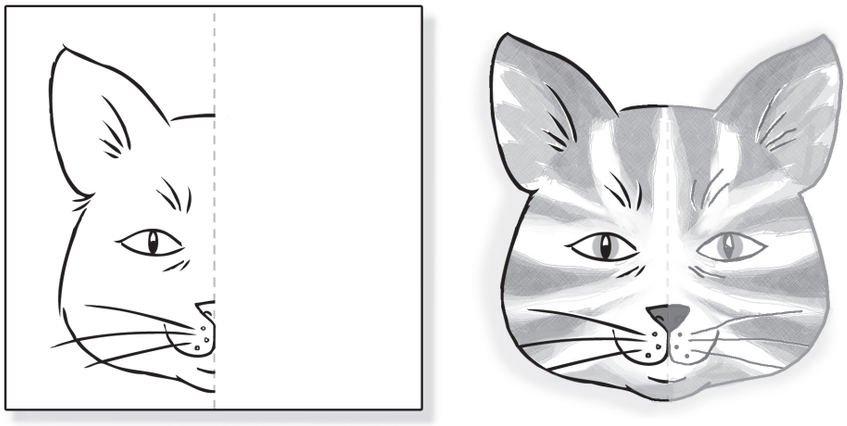
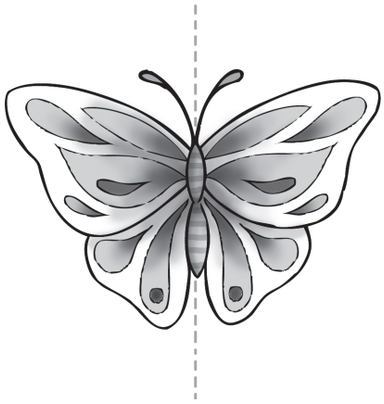


Figure 83 Folded piece of paper with image cut out and copied opposite to show symmetry.

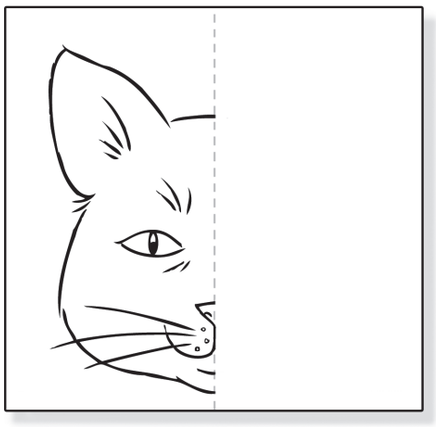
Questions to ask for Space and Shape (Geometry)

- 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?



Umfanekiso 81 Zilingana macala

Umfanekiso 82 Azilingani macala



Umfanekiso 83 Iphepha elisongiweyo nomfanekiso osikiweyo kunye nelinye icala elikhutshelweyo libonisa isimetri.

Imibuzo enokubuzwa ngesiThuba neMilo (iJiyometri)

- Ume phi?
- Yintoni ephambi/esemva kwakho?
- Ungandixelela ukuba ndisuka njani ku … ukuya ku …?
- Ungandibonisa ukuba ndiyijikeleza njani ibhokisi, phezu kwesitulo nangaphantsi kwetafile?
- Yeyiphi le milo?
- Wazi njani ukuba ngunxantathu/sisikwere/luxande/sisangqa?
- Inamacala amangaphi le milo?
- Ineekona/ubutsolo obungaphi le milo?
- Ungandixelela ntoni ngamacala ale milo?
- Ungandixelela ntoni ngomgca?
- Yintoni efanayo/eyahlukileyo ngezi milo zimbini?
- Kutheni zihambelana nje?

- 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

- Ingaba ikhona into oyibonayo eklasini ebonakala njenga le milo?
- Kunokwenzeka ntoni ukuba ndiguqule le milo? Kunokwenzeka ntoni ukuba ndijika le milo?
- Ungazisebenzisa ezi milo ukwenza imodeli yalo mfanekiso?
- Zeziphi kwezi zinto ezinokuqenggeleka/ezinokutyibilika?
- Ungazibeka ezi zinto enye phezu kwenye?
- Ngaba ezi milo zihambelana?
- Ungayifumana into enamacala amcaba?
- Ungayifumana into enamacala angqukuva?
- Mingaphi imiphetho/iikona/indawo ezitsolo enazo le bhokisi?
- Yintoni efanayo/eyahlukileyo ngezi bhokisi zimbini?

Isigama sesiThuba neMilo (iJiyometri)

Indawo kunye nesalathiso

- ngaphakathi, ngaphandle, kude, ngaphezu kwe, ngaphaya kwe, ngaphantsi, ngaphandle kwe, phezulu, ezantsi, phakathi, ngaphambili kwe, emva, ecaleni kwe, ngaphantsi ngaphezulu
- kufuphi, kude, ngaphandle, ecaleni, ngaphakathi, ngaphandle
- kufutshane, kufutshane kakhulu
- kude, kudana
- kufuphi
- ngqala, jika
- jikeleza, ecaleni, phumela
- ukuya, ukusuka, ukuya, kude kune
- isiphikisi
- phambili, ngasemva, emacaleni
- ekhohlo, ekunene

Iimilo ezinenkangeleko ka2-D

- isangqa, isikwere, uxande, unxantathu
- umgca, icala, umphetho, ikona, ubutsolo, ubukhali
- ngqukuva, ngqalileyo

Izinto ezinenkangeleko ka3-D

- ibhloko, ibhokisi, ezantsi, phezulu, amacala, imcaba
- imigca, ngqalileyo, umphetho
- ekoneni, bukhali, tsolo
- ibhola, ngqukuva, gobileyo

Isimetri (Ulingano-macala)

- iyafana ne-
- ekhohlo, ekunene
- phezulu, ezantsi

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.

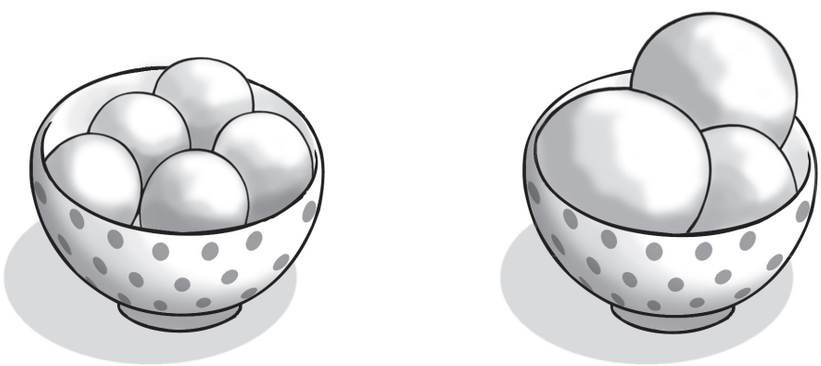


Figure 84 Estimating the amount of ice cream

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.

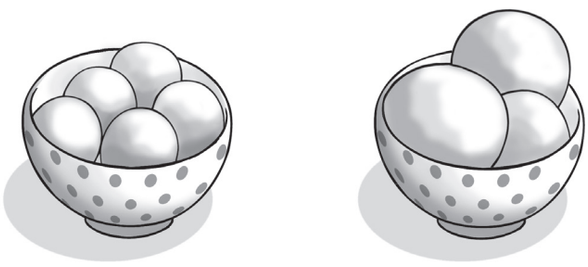
Umlinganiselo

Abantwana bazibandakanya no**mlinganiselo** xa bedlala kwaye bephononongа kubomi babo bemihla ngemihla. Baza kwiBanga R benezimvo zabo ngomlinganiselo, umzekelo ukuba umntu omdala 'mkhulu', nokuba into ethile iphezulu kakhulu ukufikeleleka, ukuba bafuna izinto ezininzi ukugcwalisa ibhokisi, ukuba kuthatha ixesha elide ukuya evenkileni. Baya kuthelekisa ukuba yeyiphi eyona inkulu kwilekese zimbini, yeyiphi eyona nqaba yeebhloko inde kakhulu okanye yeyiphi eyona inzima kakhulu kwiibhokisi zimbini. Ukuqonda kwekhonsepthi yeendidi ezahlukeneyo zomlinganiselo kuphuhla ngokuthe chu kwaye kukhula kumava emihla ngemihla abantwana, ekwenzeni, neencoko nabantu abadala kunye nabahlobo, umzekelo xa kufuneka bethathe elona qhekeza likhulu lesonka okanye bathelekise ukuphakama okanye bafumanise ukuba ngubani onezona nyawo zincinci okanye ngubani owenze eyona nqaba yeebhloko ephakamileyo. Benza izigqibo malunga nokuba yeyiphi eyona moto yokudlala kwezi zimbini enokungena egaraji kwaye zingaphi iibhloko abaza kuzidinga ukwenza igaraji ibenkulu okanye ibencinci. Basenokwenza umlinganiselo wezithako zokupheka, ukugalela amanzi okanye isanti kwijagi ukubona ukuba zingaphi iikomityi ezinokugcwaliswa, okanye bathelekise ukuba inzima kanganani ingxowa yeswekile kunye nebhokisi yamaorenji.

ULUHLU LWEENKCAZELO

umlinganiselo
'ubungakanani bento', umz. umphakamo, ubude, ubunzima, ivolumu, umthamo

Imilinganiselo kunye neeyunithi esizisebenzisayo ukulinganisa zimalunga nokufumana 'ubungakanani' bento kwinto ethile. Umlinganiselo unxulumana neminye imixholo yemathematika, enjengamanani, iipateni, imilo kunye nolwazi oluqokelelweyo. Abafundi babala ukuba zingaphi iiyunithi ezikufunekayo ukulinganisa ubungakanani bezinto eziphathekayo, ezinjengomphakamo, umthamo, ivolumu, ubude, ubunzima, okanye ubungakanani bezinto ezingaphathekiyo, ezinjengexesha, imali okanye iqondo lobushushu. Basenokuthekelela ukuba yeyiphi kwizinto 'engaphezulu' okanye 'engaphantsi', umzekelo amacephe eaysikhrim esityeni. Bayakusekela ingqikelelo yabo kubungakanani besithuba iayskhrim esithathayo, hayi kubunzima besitya okanye inani lamacephe.



Umfanekiso 84 Ukuthekelela ubungakanani beayiskhrim

KwiBanga R, umlinganiselo uyenziwa kwaye abafundi kufuneka benze imisebenzi ephathwayo enentsingiselo kubo. Ukuqonda iikhonsepthi zomlinganiselo, umzekelo ukuba into 'inzima' kangakanani na, abafundi kufuneka baphakamise izinto ukuze bathelekise ubunzima bazo. Umlinganiselo umalunga nokufumana ubukhulu okanye ubungakanani bento enye ngokuyithelekisa neeyunithi ezingekho sikweni, ezifana nezandla, iinyawo, ipensile okanye isijungqe somtya, okanye iiyunithi ezisesikweni iyunithi esesikweni yokulinganisa, efana nesentimitha okanye ilitha.

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.

Ootitshala kufuneka babaqwalasele abafundi ngexesha lemisebenzi kwaye bathethe nabo ngezimvo zabo. Ootitshala bangazisa isigama esitsha ngelixa abafundi bethelekisa, umzekelo ukuba izinto zinde kangakanani. Xa abafundi bethetha ngento ukuba 'inkulu' okanye 'incinci' utitshala angababonisa ukusetyenziswa kwesigama esichanekileyo ngokuthi alungise isigama aphinde awabize ngokufanelekileyo amagama abo. Umzekelo, xa umfundi esithi umntu mkhulu okanye mncinci ootitshala bafanele babakhuthaze ukuba bachaze eyona nto yenza abantu babebakhulu okanye babe bancinci. Ingaba ngumphakamo (ubude), okanye ububanzi okanye ubunzima bomntu?

Umfanekiso 85 Ukusebenzisa isigama semathematika

Bakuba abafundi begqibile ngoko bafuna ukukulinganisa (iathribhyuthi) kufuneka bagqibe ukuba bayakuyilinganisa njani iathribhyuthi ethile, njengomphakamo.

Umfanekiso 86 Ukusebenzisa izandla ulinganisa umphakamo

Ngale ndlela, abafundi baya kuqala ukuqonda ukuba izinto 'ezinkulu' ayizizo nje izinto ezinkulu, kwaye bangazijonga ngokobude, umphakamo okanye ubunzima.

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.

Ukuziqhelisa ...

Abafundi kwakhona badibanisa okanye bathabathe xa besombululula iingxaki zomlinganiselo eziquka inani, umzekelo xa be:

- thelekisa ubungakanani xa begalela amanzi okanye isanti kwizikhongozeli ezohlukeneyo, baya kuqonda ukuba badinga iikomityi ezi2 ukugcwalisa ijagi
- bebala ukuba zingaphi izinto abaza kuzibeka kwelinye icala lesikali ukwenza ukuba amacala alingane, baya kuqonda ukuba badinga into enye ngaphezulu okanye ezimbalwa kwaye babale inani eliphele leyo
- sakha inqaba ngeebhloko bedibanise, bathabathe kwaye babale inani leebhloko ukwenza inqaba ibe nde okanye ibe mfutshane.

Ukuphuhlisa ikhonsepthi yomlinganiselo

Abafundi kufuneka bafumane amathuba aneleyo okusombululula iingxaki ezibandakanya umlinganiselo kwaye kufuneka babenezikhongozeli ezininzi ezifanelekileyo abangazibenzisa xa besenza imisebenzi yomlinganiselo ongekho sesikweni ukuba baphande kwaye bafumane izisombululo ngokwabo. Abafundi bafuna imisebenzi ephathwayo ebandakanya uthelekiso ngokucholachola, ukugalela, ukubamba kunye nokuthetha ngoko bakuvayo.

Umfanekiso 87 Izikhongozeli zemisebenzi yemilinganiselo

Iindlela ezahlukeneyo zokwenza umlinganiselo

Uthelekiso ngqo

Umlinganiselo ugxile ekuthelekiseni 'ngqo' iathrihyuthi yento. Umzekelo, ukulinganisa ubude bepensile kubude benye ipensile okanye ukuthelekisa ubude babafundi ababini bezene ngemiva/befulathelene.

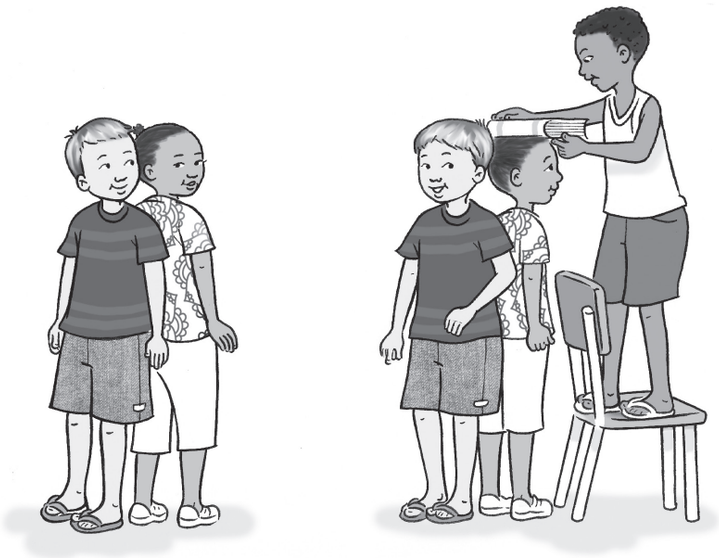


Figure 88 Comparing the height of two learners

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

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

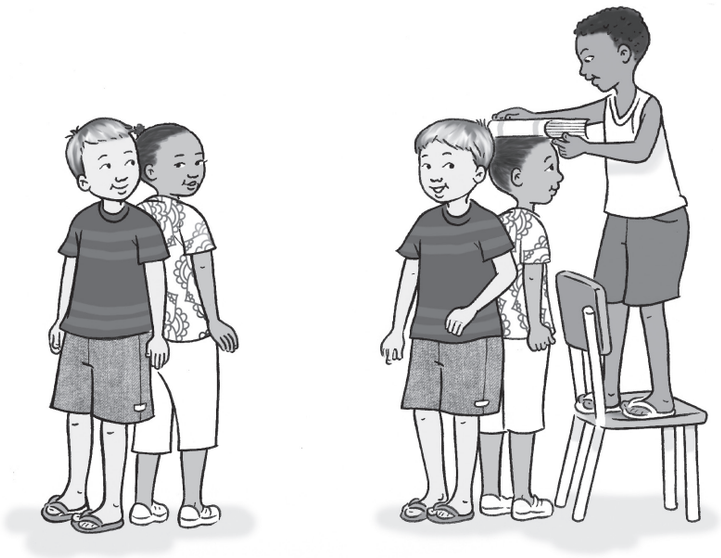
Figure 89 Tallest to shortest

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



Umfanekiso 88 Ukuthelekisa ubude babafundi ababini

'UMax mde kunoLola.'
'Mde kangakanani?'

Ukuthelekisa kubandakanya ukulandelelanisa:
'UMax mde kunoLola kodwa mfutshane kunoElton.'

Umfanekiso 89 Obona bude ukuya kobona bufutshane

Umlinganiselo ongekho sikweni

Senza umlinganiselo ongekho sikweni sisebenzisa **iiyunithi ezingekho sikweni**, umzekelo xa sisebenzisa ubude bengalo ukulinganisa isiqingatha somtya, okanye sisebenzisa iinyawo zethu ukulinganisa ubungakanani bemethi.

ULUHLU LWEENKCAZELO

iyunithi engekho sikweni
iyunithi yokwenza umlinganiselo esebenzisa izinto ezinje ngesihlangu, ikliphu yephepha okanye ityhubhu; isenokuba yinto engekho sikweni enjengesandla, iinyawo okanye ubude bomzimba

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.

Iyunithi yokulinganisa esesikweni

Sisebenzisa iiyunithi ezisesikweni ezifana neemililitha, iilitha, iisentimitha, iimitha, iigrem, iikhilogram, imizuzu kunye neeyure ukuthekelela ubude bento, bacinga ukuba inzima kangakanani okanye kuthatha ixesha elide kangakanani ukwenza into. Sisebenzisa iiyunithi ezisesikweni ukulinganisa ngokuchanekileyo.

Ukuthekelela

Abafundi badinga ukuphuhlisa izakhono zokuthekelela ngexesha lemisebenzi yabo yomlinganiselo engekho sikweni, umzekelo bafanele bathekelele ukuba bacinga ukuba into inzima kangakanani phambi kokuba benze umlinganiselo, okanye bacinga ukuba inde kangakanani into ngokusekelwe kwinani leebhloko abacinga ukuba bazakuzifuna ukuyilinganisa, okanye bacinga ukuba kuza kuthatha ixesha elide kangakanani na ukucoca iklasi. Emva koko basebenzisa izixhobo zokulinganisa ukufumana ukuba luchaneke kangakanani uthekelelo lwabo.

Ukuziqhelisa ...

Abafundi baqala ukuqonda ukuba yintoni umlinganiselo kwaye kutheni kufuneka benze umlinganiselo. Bayaqonda ukuba:

- Umlinganiselo ubandakanya uthelekiso ngqo kunye nokusetyenziswa kweeyunithi ezingekho sikweni, ezifana nezandla neenyawo, kunye nezinye iiyunithi ezifana ngqo ngobukhulu okanye ngobude ezinje ngeebhloko, umtya, imicwe yokubala.
- Iyunithi nganye inobukhulu obahlukileyo; baye baqonde ukuba umlinganiselo ngamnye ukhupha isiphumo esahlukileyo.
- Sisebenzisa iyunithi enye esesikweni ukulinganisa ukuze sonke sibe nesiphumo esifanayo xa sithelekisa iathribhyuthi.

Abafundi badinga amathuba aneleyo okwenza izigqibo ngokwabo ngento abaza kuyilinganisa nokuba baza kuyilinganisa njani. Kufuneka bethelekise iziphumo zemilinganiso yabo kwaye basebenzise iiyunithi ezahlukeneyo zokulinganisa izinto ezifanayo.

Kumabanga aphezulu, xa abafundi sele befumene izakhono zokuthelekisa nezokuthekelela, baqala ukusebenzisa iiyunithi ezisesikweni. Abanye abafundi beBanga R basenokuqhelaniswa nezixhobo zokulinganisa kumakhaya wabo kwaye kungaxoxwa ngoku ngokungekho sikweni esikolweni, umzekelo:

- iijagi zokulinganisa, amacephe okulinganisa – ukulinganisa ngeemililitha, iilitha
- iirula, iteypu yokulinganisa – ukulinganisa iisentimitha, iimitha
- izikali – ukulinganisa iigrem, iikhilogrem
- iiwotshi zesihlahla neewotshi zodonga – ukulinganisa imizuzu, iiyure.

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.

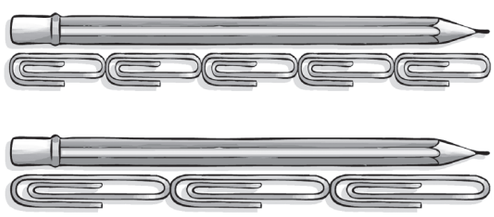


Figure 90 Measuring length with two different units of measurement

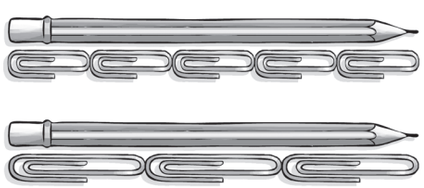
Ixesha

Imiba eyenziwayo yomlinganiselo – umgama, umthamo, ubunzima – ungaboniswa kubafundi ngemisebenzi kunye neziganeko eziqhelekileyo, kodwa ixesha liyikhonsepthi entsonkothileyo nenobunzima kubafundi ukuba baliqonde. Oku kunokubangelwa kukuba abantu abadala abasoloko besebenzisa ulwimi lwexesha ngokuchanekileyo, nokusebenzisa iintetho zemihla ngemihla ezifana nokuthi, 'Ndiya kuba lapho emzuzwini,' kodwa ke kuthathe ixesha elide kunoko. Kwakhona, abantwana abancinci bakholise ngokuphila 'kwixesha langoku' ngoko ke ukukhumbula iziganeko ezidlulileyo ngendlela okanye ukuqikelela iziganeko ezizayo kunzima kakhulu kubo. Abafundi kufuneka baqonde ukuba ixesha lidlula kanjani ebomini babo ngoko ke ootitshala kufuneka banxulumanise ixesha namava abafundi emihla ngemihla kunye neziganeko eziqhelekileyo kubo.

- Ukulandelelanisa iziganeko: Abafundi kufuneka baqonde ulwimi lwexesha ukuze bakwazi ukuthetha ngendlela ulandelelwano lweziganeko olwenzeka ngayo. Sebenzisa inkqubo yemihla ngemihla namabali ukuthetha ngokulandelelana kweziganeko emini kunye nokulandelelana kwezenzo ukugqibezela umsebenzi – 'yintoni eyenzekileyo/phambi/emva koko'.
- Iiyunithi zexesha: Thelekisa iiyunithi ezahlukeneyo zexesha: ixesha lesikolo likusasa, ixesha lokugoduka lisemvakwemini, ixesha lokulala lisebusuku, 'uza kulala' kabini ibe ngumhla wakho wokuzalwa. Yenza itshati yemozulu, gcina ikhalenda yenyanga urekhodishe iziganeko ezibalulekileyo kwithayimthebhile enemifanekiso. Thetha 'ngo-izolo, namhlanje, ngomso'. Ngokuthe chu abafundi baqala ukuqonda ukuba ixesha likhula njani ukuya kwiintsuku zeveki, iinyanga zonyaka kunye namaxesha onyaka.
- Amazinga esantya: Balekani ugqatso ngaphandle. Sebenzisa umbhobho weplastiki ukwenza imizila ukuqengqelekisa amabhastile nemiqengqelezi yokuqhubela iimoto phezulu nasezantsi. Danisela umculo ocothayo nokhawulezayo. Buza abafundi ukuba kubathatha ixesha elingakanani ukuxukuxa amazinyo okanye ukuhamba bejikeleza isikolo. Thetha ngeentshukumo nemisebenzi ekhawulezayo, egqibeka msinya kunye necothayo.

Ubude

KwiBanga R, kugxilwa ekuthekeleleni, kumlinganiselo, ukuthelekisa kunye nokulandelelanisa ubude nomgama. Abafundi kufuneka baqonde ukuba ukuze bafumanise ubude bento kufuneka benze umlinganiso wayo ukusuka ekuqaleni kwelinye icala ukuya ekugqibeleni kwelinye icala. Umzekelo, bangenza umlinganiselo wepensile besebenzisa iikliphu zamaphepha njengeeyunithi ezingekho sikweni. Lo mfanekiso ungezantsi ubonisa indlela ipensile enokulinganiswa ngayo kusetyenziswa iiyunithi ezahlukeneyo zomlinganiselo. Kumfanekiso wokuqala kukho iikliphu zamaphepha ezintlanu ize kumfanekiso wesibini kubekho iikliphu zamaphepha ezinkudlwana ezintathu.



Umfanekiso 90 Ukulinganisa ubude ngeeyunithi ezahlukeneyo ezimbini zemilinganiselo

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

Abafundi basenokulinganisa ukusuka phezulu ukuya ezantsi ukufumana ubude bento, umz. ukufumana ubude babafundi kwigumbi lokufundela. Emva koko ungabamisa ngokulandelelana ukusuka koyena mde ukuya koyena mfutshane.

- Uthelekiso ngqo: Fumana izinto ezinde kune-/nezimfutshane kune … Hlela izinto ngokobude nangokomphakamo. Thetha kwaye uchaze ukuba kutheni izinto zihlelwe ngendlela ethile.
- Iiathribhyuthi: Thetha ngobude, umphakamo okanye ububanzi obuza kulinganiswa.
- Iiyunithi ezingekho sikweni: Sebenzisa izandla, amagqabi, iipensile ukulinganisa nokuthelekisa izinto.
- Iiyunithi ezingekho sikweni ezifanayo: Sebenzisa ubukhulu beyunithi ezilinganayo, umzekelo, iibhloko. Zibeke ecaleni kubude bento leyo kulinganiswa yona. Emva koko sebenzisa ibhloko enye umane uyisusa, ubala inani leentshukumo.

Ubunzima

KwiBanga R kugxilwe ekuthekeleleni, ekulinganiseni, ekuthelekiseni nasekulandelaniseni izinto ngokobunzima okanye ubukhaphukhaphu bazo. Kuthatha ixesha ukuba abafundi bayiqonde ikhonsepthi yokuba ubukhulu kunye nobunzima bohlukile. Abafundi kufuneka baphonononge izinto ezincinci ezinobunzima, izinto ezincinci ezikhaphukhaphu, izinto ezinkulu ezinzima kunye nezinto ezinkulu ezikhaphukhaphu kwaye benze uthelekiso phakathi kwazo. Ootitshala kufuneka bancede abafundi bagxile ekubeni into inzima kanganani, hayi kubukhulu bayo.

- Uthelekiso ngqo: Bamba into uze uthekelele **ubunzima** bayo. Fumana izinto ezinzima okanye ezikhaphukhaphu kunaloo nto.
- Iiathribhyuthi: Thetha ngemilo, ubungakanani nobunzima bento elinganiswayo.
- Iiyunithi ezingekho sikweni: Sebenzisa isikali sokulinganisa ukuthelekisa ubunzima bezinto. Beka into ezakulinganiswa kwelinye icala lesikali. Beka enye into (okanye ngaphezu kwenye) kwelinye icala lesikali ukuyenza ibe kwinqanaba elilinganayo.
- Iiyunithi ezingekho sikweni ezifanayo: Sebenzisa iyunithi enobungakanani obufanayo, umzekelo ibhloko enkulu okanye incwadi, ukuthelekisa ubunzima bezinto usebenzisa isikali.

ULULHU LWEENKCAZELO

ubunzima
indlela enzima ngayo into

Umthamo

Umthamo wento bubungakanani obunokuthwalwa yinto leyo, umzekelo ibhotile yelitha yobisi ingathwala ilitha enye yamanzi. KwiBanga R, kugxilwa ekuthekeleleni, ekulinganiseni, ekuthelekiseni kunye nasekulandelelaniseni izikhongozeli ngokomthamo eziwuthwalayo. Ootitshala kufuneka banike abafundi amathuba amaninzi okuba basebenzise iikhonsepthi ezinjengo ayinanto kunye no-igcwele, umz. xa begcwalisa okanye bekhuphela izikhongozeli ngamanzi okanye isanti nangexesha lokutya. Abafundi bangagcwalisa izikhongozeli ngezinto ezahlukeneyo kwaye bathethe ngomthamo wazo: ‘Zingaphi iikomityi zamanzi ezifunekayo ukugcwalisa le jagi? Kutheni sifuna iibhotile zobisi ezimbalwa zamanzi ukugcwalisa ijagi?’

ULULHU LWEENKCAZELO

umthamo
obona bungakanani into (enjenge emele okanye ibhokisi, ibala lebhola) enokubuthwala

- 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

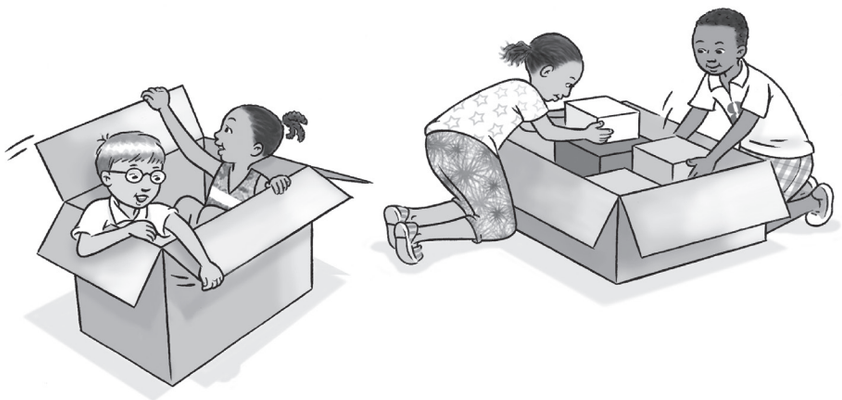


Figure 91 Exploring capacity and volume

- 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?'

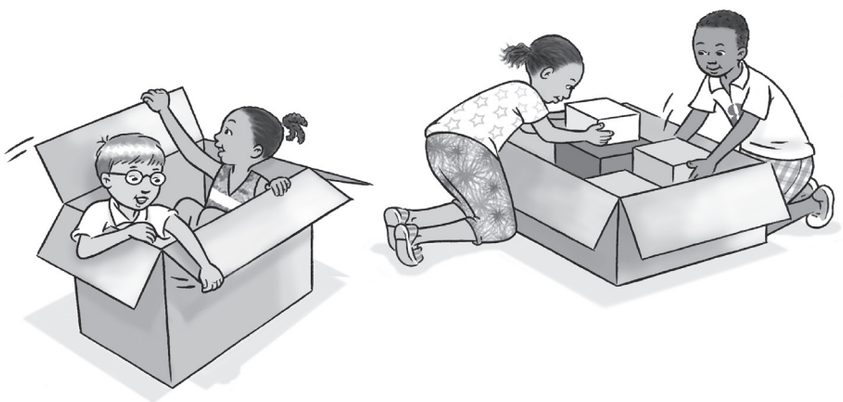
- Uthelekiso ngqo: Gwcalisa, khuphela uze ugalele phakathi kwezikhongozeli ezibufana usebenzisa amanzi okanye isanti ukufumana ukuba zithwala umthamo olinganayo na. Kuqala, abafundi basenokuthekelela ukuba isikhongozeli eside kwezi zimbini siya kuthwala amanzi amaninzi.
- Iiyunithi ezingekho sikweni: Yenza ilinge lokubona ukuba izikhongezeli ezahlukileyo zinokuthwala amanzi okanye isanti engakanani na. Thelekisa ukuba sesiphi esithwala 'ngaphezulu' okanye 'ngaphantsi'. Gcwalisa esinye isikhongozeli ukuze ugalele amanzi okanye isanti kwenye ukuze ubone ukuba iyaphuphuma okanye kukho isithuba esishiyekileyo sokuba kugalelwe amanye amanzi. Gcwalisa izikhongozeli ezide nezibanzi uze uzibeke ngokulandelelana kwazo ukusuka kwesona sithwala kakhulu ukuya kwesona sithwala kancinci.
- Iiyunithi ezingekho sikweni ezifanayo: Bala inani lamacephe okanye leekomityi ezizalisa izikhongozeli ezinobukhulu obufanayo okanye obahlukileyo.

Ivolumu

Ivolumu imalunga nobungakanani obuthwelwe yinto leyo, njengamanzi, isanti, irayisi okanye iswekile. KwiBanga R, ugxilo lokulinganisa kufanele lube sekubeni isikhongozeli sithwala kangakanani (umthamo) kunobungakanani bomthamo wesithuba isikhongozeli esisithathayo (ivolumu). Ivolumu ingatshintsha ngokomlinganiselo oqulathwe yinto ngelo xesha, kodwa umthamo uhlala ufana, umzekelo, umthamo wejagi eyilitha e1 nokuba inento engakanani na ngelo xesha. Le yeyona khonsepthi inzima kwiBanga R ukuba bayibambe.

ULUHLU LWEENKCAZELO

ivolumu
ubungakanani obuthwalwa yinto okanye isithuba esithathwa yinto leyo



Umfanekiso 91 Ukuphononongo umthamo nevolumu

- Uthelekiso ngqo: Abafundi balinga ngezikhongozeli ezineemilo ezahlukeneyo ukufumanisa ukuba sikhulu kangakanani na isikhongozeli kwaye bacinga ukuba singakuthwala kangakanani na.
- Iiyunithi ezingekho sikweni: Dadisa izikhongozeli ezinjengebhokisana zeplastiki, isikhongozeli sebhotolo yamandongamane, iijagi zokukha amanzi, phezu kwamanzi. Zigcwalise ngezinto zokubala okanye ngesanti kwaye nize nixoxe ukuba kwenzeka ntoni. Buza imibuzo efana no: 'Ingaba zisadada phezu kwamanzi? Kwenzeka ntoni kula manzi ase-emeleni? Ingaba ayachitheka?'

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

Imibuzo enokubuzwa ngoMlinganiselo

- Wenze ntoni ukuvuka kwakho?
- Wenza ntoni elandelayo?
- Kwenzeke ntoni emva koko?
- Wenze ntoni phambi koko …?
- Wenza ntoni emva koko …?
- Yeyiphi eshukuma ngokukhawuleza/kancinci/kakhulu?
- Loluphi usuku …? Kuza kuba loluphi usuku oluzayo …?
- Yeyiphi ende/emfutshane?
- Yeyiphi enzima/eyona ikhaphukhaphu?
- Zingaphi iikomityi/amacephe/iibhotile i … ezithwalayo?
- Sesiphi isikhongozeli esithwala ngaphezu kwesi sikhongozeli?
- Sesikabani isikhongozeli esinomthamo omninzi? Wazi njani?
- Ndinxanwe ngokwenene. Yeyiphi ikomityi emandiyisebenzise? Kuba kutheni?

Isigama soMlinganiselo

- tshatisa, hlela, thelekisa, landelelanisa
- umlinganiselo, efanayo

Ixesha

- phambi, emva, elandelayo, ngoku, ngoko
- ngokukhawuleza, cothayo
- imini, ebusuku, kusasa, emva kwemini
- namhlanje, izolo, ngomso
- iveki, iintsuku zeveki
- inyanga, iinyanga zonyaka
- ikhalenda
- unyaka, umhla
- ukwindla, ubusika, intlakohlaza, ihlobo, amaxesha onyaka

Ubude

- elide kangakanani, mfutshane, banzi, de
- indana, indana, imfutshane, ibanzi
- eyona imfutshane ukuya kweyona inde, inde ukuya kumfutshane

Ubunzima

- enzima, enzinyama kune-, enzima kuzo zonke
- ekhaphukhaphu, ikhaphukhaphu kune-, ikhaphukhaphu kunazo zonke

Umthamo

- ngaphezulu, ngaphantsi, engenanto, egcweleyo

Ivolumu

- inkulu, incinci, nkulu, ncinci, ncinane

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.

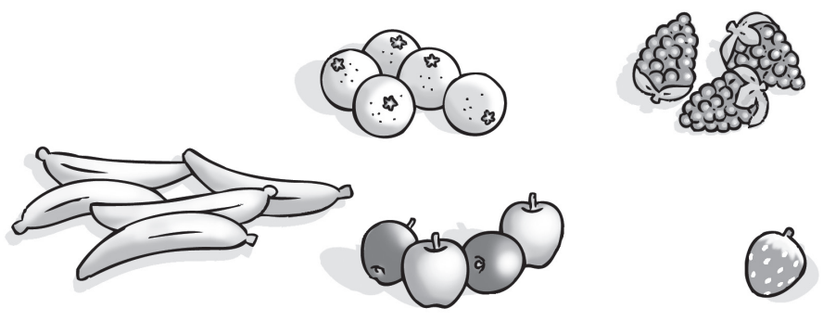


Figure 92 Collecting, sorting and organising into groups

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.

ULwazi oluQokelelweyo

Abantwana abancinci babuza imibuzo njengoko bezama ukwenza intsingiselo kwilizwe abaphila kulo. Ootitshala kufuneka babakhuthaze abafundi beBanga R ukuba babuze imibuzo kwaye bafune ingcaciso. Le mibuzo ingasetyenziswa njengesiseko sokuqokelela iinkcukacha nokufumana ngezinto kunye neziganeko.

Ukuhlela nokwahlulahlula

Abafundi basoloko behlela kwaye **bahlula** izinto ezibangqongileyo ngokweendlela ezahlukeneyo. Babeka izinto ngokwamaqela ombala kunye nobukhulu obahlukileyo, bapakisha baphinde bothule izinto emakhaya nasesikolweni, bezihlela ngokwamaqela eemilo nemisebenzi eyahlukileyo, umzekelo:

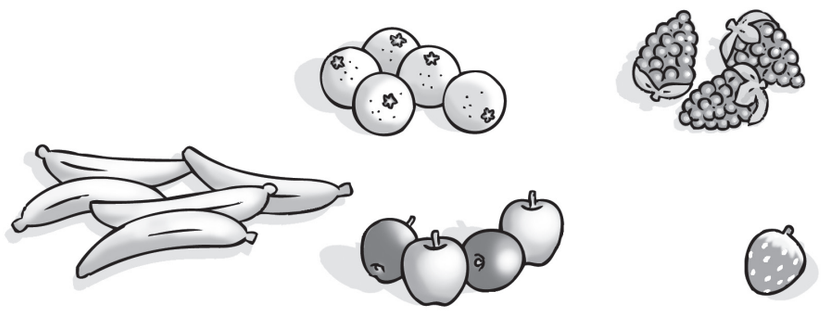
- ukuhlela nokutshatisa amaqela ezinto: iikawusi, izihlangu, iipleyiti, iikomityi
- ukupakisha izinto: iinkonkxa, iibhokisi, iibhotile, izixhobo zokubala
- ukuhlela izixhobo zokubala okanye izinto zokudlala ngokweathribhyuthi: umbala, ubungakanani, uhlobo
- ixesha lokucoca (lokuqoqosha): iincwadi, iibhloko, iiphazili, imidlalo, iikhrayoni.

ULUHLU LWEENKCAZELO

ukwahlula
indlela yokubeka izinto ngokwamaqela ngendlela elungileyo, umz. ukwahlula iimpahla ngokwezasebusika nangokwezasehlotyeni

Izinto zingahlelwa kwaye zahlulwe ngokwendlela ezifana ngayo, ezinjengombala. Ngokuya abafundi besazi ngeempawu zezinto ezifana nezityalo kunye nezilwanyana, neendlela ezifana nezahluke ngazo, baya kukwazi ukuzahlula ngokwamaqela ahlukeneyo.

ULwazi oluQokelelweyo lubandakanya ukuqokelela, ukuhlela nokulungisa, ukubonisa kunye nokutolika ulwazi ngeenjongo zokusombulula iingxaki okanye ukuphendula umbuzo, umz. 'Bangaphi abafundi abathanda ukutya ama-apile?' Ukuze siphendule lo mbuzo, abafundi kufuneka baqokelele ulwazi, baluhlele baze balubeke ngendlela eyakwenza ukuba kubelula kubo ukutolika ulwazi ngenjongo yokuphendula umbuzo.



Umfanekiso 92 Ukuqokelela, ukuhlela nokulungisa ulwazi ngokwamaqela

ULwazi oluQokelelweyo lunganxulumana nezinye iinkalo zemfundo, umzekelo, ukufumanisa:

- ngelizwe elisingqongileyo, ngokuthi baphonononge babhale ingxelo yemozulu yemihla ngemihla okanye ukuqokelela iindidi ezahlukileyo zamagqabi
- ngezinto abakholwayo zizo, ezifana nemibala abayithandayo
- ngokutya okusempilweni, okufana neziqhamo kunye nemifuno.

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.

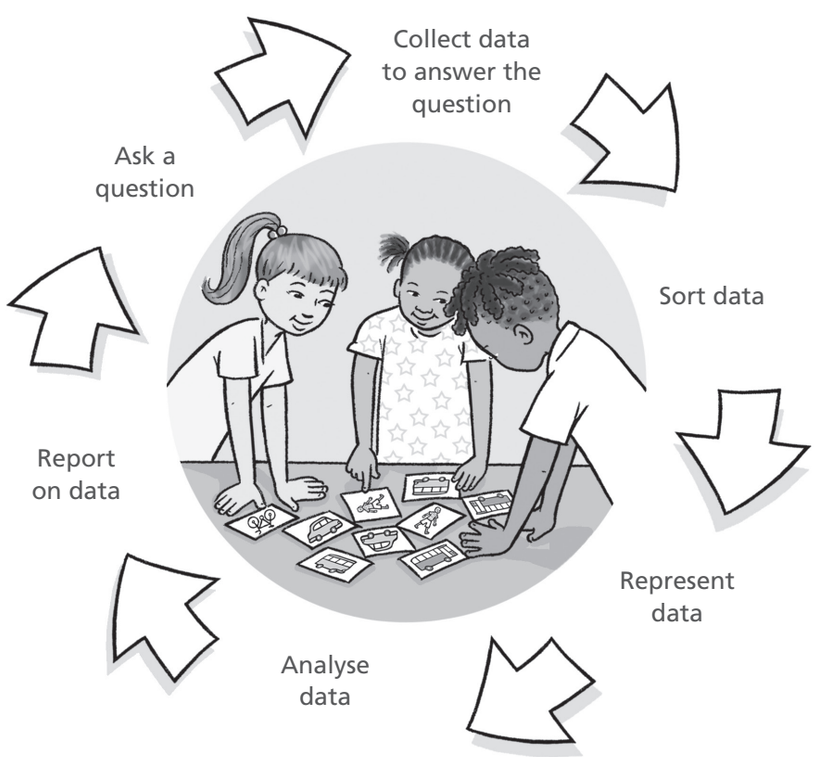


Figure 93 The Data Handling cycle

Ukuchonga iiathribhyuthi

Ekuqaleni, abafundi basota baze bahlele izinto ngokweathribhyuthi enye, enjengombala, ubungakanani okanye imilo. Ngokuthe chu banokunika izizathu zokuba kutheni bebeke izinto ngokwamaqela nangendlela ethile. Basenokucinga nezinye iindlela zokubeka izinto ezinye, ngokwenye iathribhyuthi eyahlukileyo. Njengokuba abafundi bephononongа kwaye bethetha ngendlela abaqokelela, abalungisa kunye nabahlela ngayo 'izinto' ezibangqongileyo, baqalisa ukucwangcisa izinto ngokwamaqela ngokusekwe kwiathribhyuthi engaphezu kwenye, ezifana nombala kunye nemilo yezinto.

Ukuziqhelisa ...

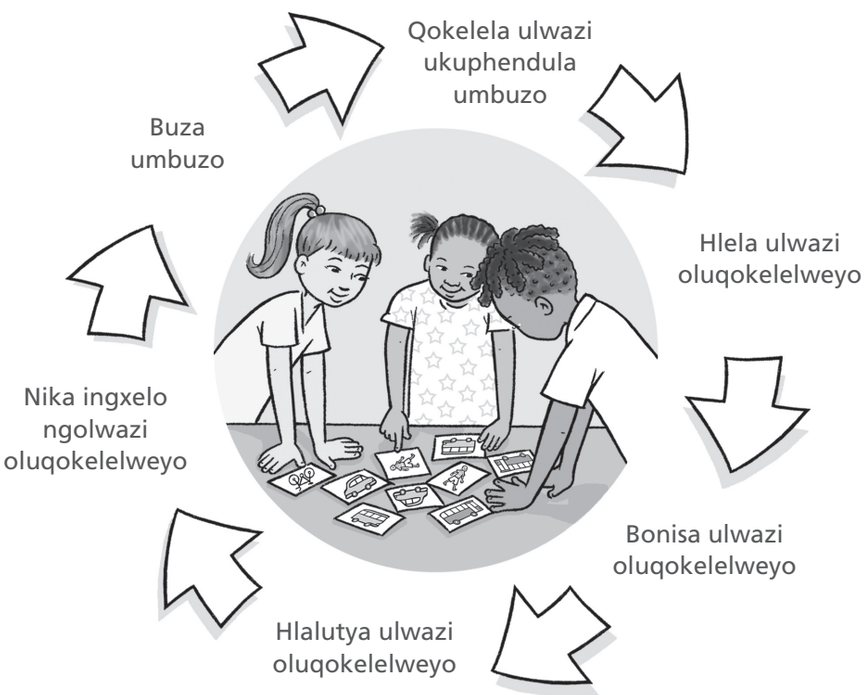
Utitshala angabacela abafundi ukuba bahlele ingqokelela yeemilo ezinemibala eyahlukileyo:

- Bafumane zonke iimilo eziluhlaza.
- Bafumane zonke izikwere.
- Bafumane izikwere eziluhlaza.

Ukuhlela ngokweeathribhyuthi ezimbini ngumngeni kubafundi kuba kufuneka baqale baqonde ngokwekhonsepthi umahluko phakathi kwala maqela mathathu. Amabini kula maqela aneathribhyuthi enye qha, ngelixa iqela lesithathu lineeathribhyuthi ezenza zingene kumaqela omabini.

Umjikelo woLwazi oluQokelelweyo

Abantu badla ngokubhekisa kwinkqubo yoLwazi oluQokelelweyo njengomjikelo kuba iziganeko okanye imisebenzi ebandakanyekayo iphindaphindwa ngolandelelwano olufanayo kumbuzo ngamnye omtsha ophendulwayo.



Umfanekiso 93 Umjikelo woLwazi oluQokelelweyo

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

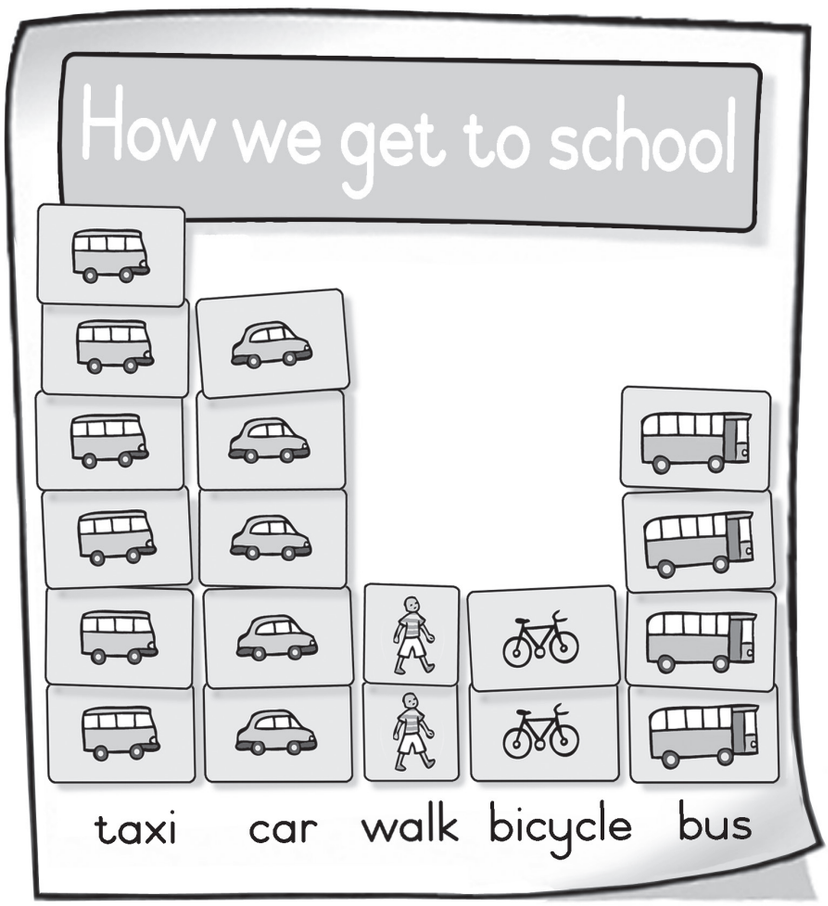


Figure 94 A pictograph

1. **Buza umbuzo:** Abafundi benza isigqibo sokuba yintoni abafuna ukuyazi, umz. 'Ingaba bangaphi abafundi abeza esikolweni ngebhasi kwaye bangaphi abeza ngemoto?' Umsonto wokubamba ulwazi oluqokelelweyo sisizathu sokuqokelelwa kolwazi okanye iinkcukacha ezithile. Oku kuthetha ukuba ulwazi oluqokelelweyo okanye amaqela enziweyo ngokuhlela kufuneka abenegalelo ekuphenduleni umbuzo abafundi abagqibe ukuba bafuna ukufumana iimpendulo zawo.
2. **Qokelela ulwazi:** Abafundi bathatha isigqibo ngendlela abafuna ukuqokelela ngayo ulwazi ngokubhekise kumbuzo okanye ingxaki, umzekelo ngokubuza abanye abafundi ukuba baya kanjani esikolweni kwaye bazobe umfanekiso ngomfundi ngamnye.
3. **Ukuhlela ulwazi:** Abafundi balungisa baze bahlele ulwazi oluqokelelweyo ngamaqela ngokweathribhyuthi. Ukuze baphendule imibuzo kwaye bathathe isigqibo ngendlela yokubonisa ulwazi abaluqokeleleyo, isigqibo kufuneka senziwe ngendlela izinto ezingahlelwa ngayo.
4. **Bonisa ulwazi:** Abafundi bahlola iindlela ezahlukeneyo zokubonisa iinkcukhaca abaziqokeleleyo, umz. ngokubeka izinto zokwenyani emethini okanye bakhe **ipikthografu (igrafu yemifanekiso)**.
5. **Hlalutya ulwazi:** Abafundi bachaza kwaye bathelekisa iinkcukacha ezibonisweyo, umz. yeyiphi indlela yokuza esikolweni esetyenziswa kakhulu okanye kancinci.

ULULHU LWEENKCAZELO

ipikthografu (igrafu yemifanekiso)
indlela yokubonisa ulwazi oluqokelelweyo usebenzisa imifanekiso

Umfanekiso 94 Ipikthografu

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. **Ingxelo ngolwazi:** Abafundi baphendula umbuzo obubuziwe ekuqaleni, 'Inokuba bangaphi abafundi abeza esikolweni ngebhasi nokuba bangaphi abeza ngemoto?' Bangabona lula ukuba abafundi abane beza esikolweni ngebhasi baze abafundi abahlanu beze esikolweni ngemoto. Banako ukuthelekisa nezinye iinkcukacha ezifana nokuba bangaphi abafundi abeza esikolweni ngezinye iindlela kwaye sesiphi isithuthi esisetyenziswa kakhulu okanye kancinci.

Imibuzo yokubuzwa ngoLwazi oluQokelelweyo

- Leliphi iqela elinezininzi/elinezimbalwa? Ungandichazela ngaphandle kokubala?
- Leliphi iqela elinezininzi/ezimbalwa?
- Ucinga ukuba impendulo iza kuthini?
- Sizakuyifumanisa njani?
- Kutheni ubeke ezi zinto endaweni enye?
- Ungazibeka ezi ngenye indlela?
- Ingaba ezi zezalapha?
- Ingaba amaorenji okanye iibhanana zezona ziqhamo zithandwa kakhulu?
- Zingaphi iintsuku ebezi: nelanga, nomoya, nemvula, …?
- Kunokwenzeka ntoni ukuba …?

Isigama soLwazi oluQokelelweyo

- tshatisa, hlela, thelekisa
- fanayo, yohlukile, yeyalapha, ayiyoyalapha
- ngaphezulu kune-, ngaphantsi kune-, fanayo
- njalo, ngamanye amaxesha, zange
- umqolo, ikholamu
- mhlawumbi, kunokwenzeka, qiniseka

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

Uluhlu lweenkcazelo

amalungu izinto, iintshukumo okanye iziganeko kwipateni

gca chanekileyo, cacileyo

iimbono ezingabonwayo uluvo, ingcinga okanye imvakalelo

iisimboli izinto ezibonisa okanye ukumela into, njengesimboli yenani, ilogo okanye iimpawu

ijiyometri ibakala lemathematika elijongene neempawu, imilinganiselo nolwalamano kwiikona, imigca kunye neekona zemilo kwisithuba

ikhonsepthi ngumbono oqikelelwayo. Ngamanye amagama, awubambeki okanye uphathwe umz. ukuvuya okanye uthando. Iikhonsepthi zemathematika ziquka inani, ukubala, isithuba, ukuthabatha nokudibanisa.

iimpawu iimpawu zemilo zika2-D okanye zezinto ezingu3-D, umz. ubude, ububanzi, ukuphakama, amacala (ubuso), imiphetho neekona

ingqiqo ukucinga ngoluvo okanye ingxelo

ipateni ulandelelwano lwezinto njengesiqhelo, iintshukumo okanye iziganeko eziphindaphindeneyo ngendlela enokuxelwa kwangaphambili

ipikthografu (igrafu yemifanekiso) indlela yokubonisa ulwazi oluqokelelweyo usebenzisa imifanekiso

isimetri (ulingano-macala) xa imilo okanye into inokohlulwa ibe ziziqingatha ezibini ezilinganayo kumgca ophakathi

ivolumu ubungakanani obuthwalwa yinto okanye isithuba esithathwa yinto leyo

iyunithi engekho sikweni iyunithi yokwenza umlinganiselo esebenzisa izinto ezinje ngesihlangu, ikliphu yephepha okanye ityhubhu; isenokuba yinto engekho sikweni enjengesandla, iinyawo okanye ubude bomzimba

izakhono nezivamvo ukusebenzisa izivo zakho uqokelela ulwazi ngobume bendawo, umzekelo: ukubona, ukuva, ukubamba, ukujoja (ukunukisa) nokungcamla

neenkangeleko ezimbini (2-D) imilo eneenkangeleko ezimbini: ubude nobubanzi

neenkangeleko ezintathu (3-D) into eneenkangeleko ezintathu: ubude, ububanzi nokuphakama

ubunzima indlela enzima ngayo into

uhlolo olwakhayo uhlolo olunika ingxelo ngomfundi ngelixesha ukufunda nokujonga inkqubela phambili yomfundi kuqhubeka

ukubala ngengqiqo ukubala izinto ukufumanisa ukuba 'zingaphi' (kukwaziwa ngokuba kukubala okuneziphumo)

ukubala ngentloko ukubala ukwaza, ubiza amanani ngendlela eyiyo (kukwaziwa ngokuba kukubala ngomlomo okanye ucengceleza)

ukubala ngomlomo ukubala ukwaza, ubiza amanani ngendlela eyiyo (kukwaziwa ngokuba kukubala ngentloko okanye ucengceleza)

ukubala okuneziphumo ukubala izinto ukufumanisa ukuba 'zingaphi' (kukwaziwa ngokuba kukubala ngengqiqo)

ukubala ucengceleza ukubala ukwaza, ubiza amanani ngendlela eyiyo (kukwaziwa ngokuba kukubala ngomlomo okanye ngentloko)

ukubukela ukusebenzisa izivo ukufumanisa ngezinto, iziganeko kunye nokuziphatha. Kufuneka sibukele ukuqokelela ulwazi malunga nelizwe umz. ukujonga nokuphulaphula ngenyameko okwenzeka jikelele kuwe.

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

ukuhlela ukufumana izinto ezifanayo, okanye ezibufana, kwaye uzibeke ngamaqela ngokweempawu ezithile. Qala uhlele ngophawu olunye, olunje ngombala, umz. 'zonke iimilo eziluhlaza'. Emva koko hlela ngeempawu ezimbini ezinje ngombala nobukhulu, umz. 'zonke iimilo ezincinci eziluhlaza'.

ukukhula okuqhubekela phambili indlela izakhono neekhonsepthi ezakhela phezu kwezinye nezilandelelana ngayo

ukulandelelanisa ukubeka izinto ezintathu nangaphezulu okanye iziganeko zilandelelane, umz. imisebenzi yeklasi yemihla ngemihla, imisebenzi yakusasa yabantwana ('emva kokuba ndivukile ndiyaphakama ebhedini, ndihlambe ubuso, nditye isidlo sakusasa …') okanye iziganeko ebalini

ukumela ukusebenzisa izinto, iisimboli okanye izenzo ukubonisa umbono okanye ikhonsepthi

ukuqikelela ukucingela okuzakwenzeka kwixesha elizayo

ukusabhathayza ubuchule bengqondo bokuqaphela ngokukhawuleza inani lezinto lilonke kwingqokelela ngaphandle kokubala

ukuthelekisa ukufumana ukufana nomahluko phakathi kwezinto ezimbini nangaphezulu, umz. 'ezi zizilwanyana zombini kodwa esinye sazo sizuba esinye sibomvu'. Ukuthelekisa kukufumana unxulumano phakathi kwezinto ngokusekelwe kwiimpawu ezithile. Esi sakhono sikhokelela ekwazini ukuhlela izinto.

ukutshatisa ukuchonga izinto ezifanayo kwizinto ezimbini nangaphezulu – umz. zonke izinto ezimthubi. Ukutshatisa sisakhono esibalulekileyo sokufunda ukubala uthelekisa enye nenye.

ukwahluka iqela labantu abahlukileyo, umzekelo ngobuqu, amandla okwenza izinto, imidla kunye nemvelaphi

ukwahlula indlela yokubeka izinto ngokwamaqela ngendlela elungileyo, umz. ukwahlula iimpahla ngokwezasebusika nangokwezasehlotyeni

ulandelelaniso indlela ethile apho izinto, iintshukumo okanye iziganeko ezilandelelana ngayo

ulungelelwaniso indlela izinto ezibekwe ngayo ngokunxibeleleneyo enye kwenye

ulwazi lwangaphambili ulwazi abafundi abasele benalo kunye nezinto asele bekwazi ukuzenza

umbono ifuthe lomgama okanye lobunzulu kwimbonakalo yezinto

umgaqo ziingcebiso, umthetho jikelele ovunyiweyo ukuba uyinyani

umlinganiselo 'ubungakanani bento', umz. umphakamo, ubude, ubunzima, ivolumu, umthamo

umthamo obona bungakanani into (enjenge emele okanye ibhokisi, ibala lebhola) enokubuthwala

ungenelelo umsebenzi owenziwa kunye apho umntu owazi ngaphezulu okanye onezakhono ezingaphezulu ekhokela abanye bafunde into entsha

unxibelelwano nxibelelana nabanye abantu; yenza izinto nabanye abantu

unxulumaniso indlela izinto kunye nezimvo ezinxulumene ngayo

uphawu (iathribhyuthi) imbonakalo okanye uphawu lwento, umzekelo, umbala okanye imilo

uphuhliso nokusetyenziswa ziindlela ezohlukeneyo zokusebenzisa iikhonsepthi zemathematika, umz. ukubala imali yokukhwela iteksi okanye ukwahlulela abahlobo abathathu ipakethi yamandongomane

uquko sisenzo esiqinisekisa ukuba bonke abantwana, nokuba banowuphi umahluko, bayabandakanywa kwimisebenzi eyenziwa eklasini

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