



REPORT ON THE QUALITATIVE ANALYSIS OF ANA 2011 RESULTS



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

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1. INTRODUCTION

The Department of Basic Education (DBE) conducted the Annual National Assessments (ANA) in February 2011 in literacy/language and numeracy/mathematics. The tests were set for the learners who had completed grades 1-6 in 2010. The DBE conducted a qualitative analysis of learners' responses to identify specific areas of weakness. This analysis would help the DBE to consider possible intervention strategies to address such challenges.

For the Grade 3 and Grade 6 item analysis the scripts that were used were those that had been randomly sampled to be marked by the Human Sciences Research Council (HSRC) as part of the ANA verification process. For the Grades 1, 2, 4 and 5 the samples of scripts that were used for the item analysis were selected randomly from those that had been marked by teachers at school level in each of the nine provinces.

The qualitative analysis involved determining the difficulty levels of the questions and then evaluating learner responses according to the competencies, skills and knowledge that were being tested. Where possible, typical learner responses were identified and included in the report, to illustrate what learners could or could not do in the tests.

This report outlines the overall performance, trends in learner performance in literacy/language and numeracy/mathematics, quality of learner performance indicated by a summary of key observations from the qualitative analysis of learner responses, item analysis results by grade and subject, competency levels in percentages and proposals on some relevant interventions to improve the levels and quality of learner performance in the system.

2. PURPOSE

The purpose of this report is to share information on what learners were able and not able to do in the assessment. The analysis provides evidence to inform and direct appropriate interventions for a) teaching and learning, b) curriculum implementation management by School Management Teams (SMTs), c) curriculum and management support at district level d) resource provision and e) monitoring at provincial and national levels.

3. OVERALL PERFORMANCE

The overall performance of learners as reflected in the ANA 2011 results was very low with average scores of 30% and lower in languages and mathematics at each grade. There were instances where some learners had not answered a single item in some tests. However, there were instances where some learners or all learners in a school had performed exceptionally well. This confirms the disparities in our schools which must be addressed, using ANA results.

4. TRENDS IN PERFORMANCE

The following were some of the trends and patterns that were observed regarding learner performance.

4.1 PERFORMANCE ACROSS GRADES

Although learners did not necessarily write identical tests, Grade 1 and 2 learners performed reasonably well, with average performance higher than 50% in some schools. However, from Grade 3 through to Grade 6 scores tended to dip remarkably and dropped significantly from Grade 4 onwards. It is important to note though, that the teachers had to read questions for Grades 1 and 2, and that the learners in Grades 3 to 6 had to read questions on their own. Later in the report reference is made to the inability of learners to read functionally as a potential barrier to effective learning.

Figures 1 and 2 each shows a summary of the trends that in the performance of learners across the grades, in literacy/language and numeracy/mathematics, respectively. The trends are based on average percent scores (Ave %).

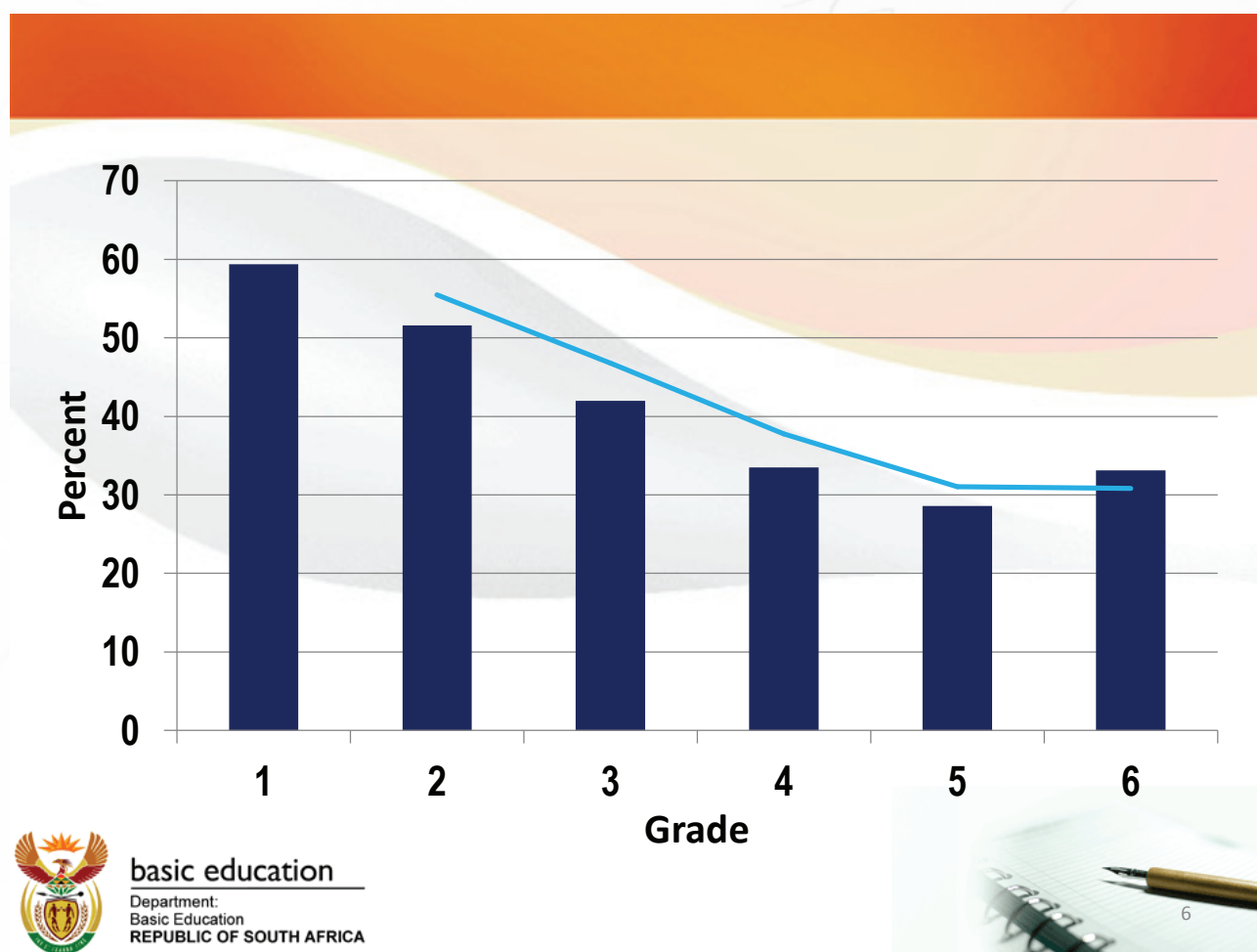


Figure 1: Level, trends & quality of performance: Literacy

From Figure 1 the average score percent dropped from 63% at Grade 1 to just above 31% at Grade 6 level. The lowest average score percent was 28% at both Grades 4 and 5. Like in language, performance in mathematics tended to decline both quantitatively and qualitatively across the grades.

Level, trends & quality of performance: Numeracy

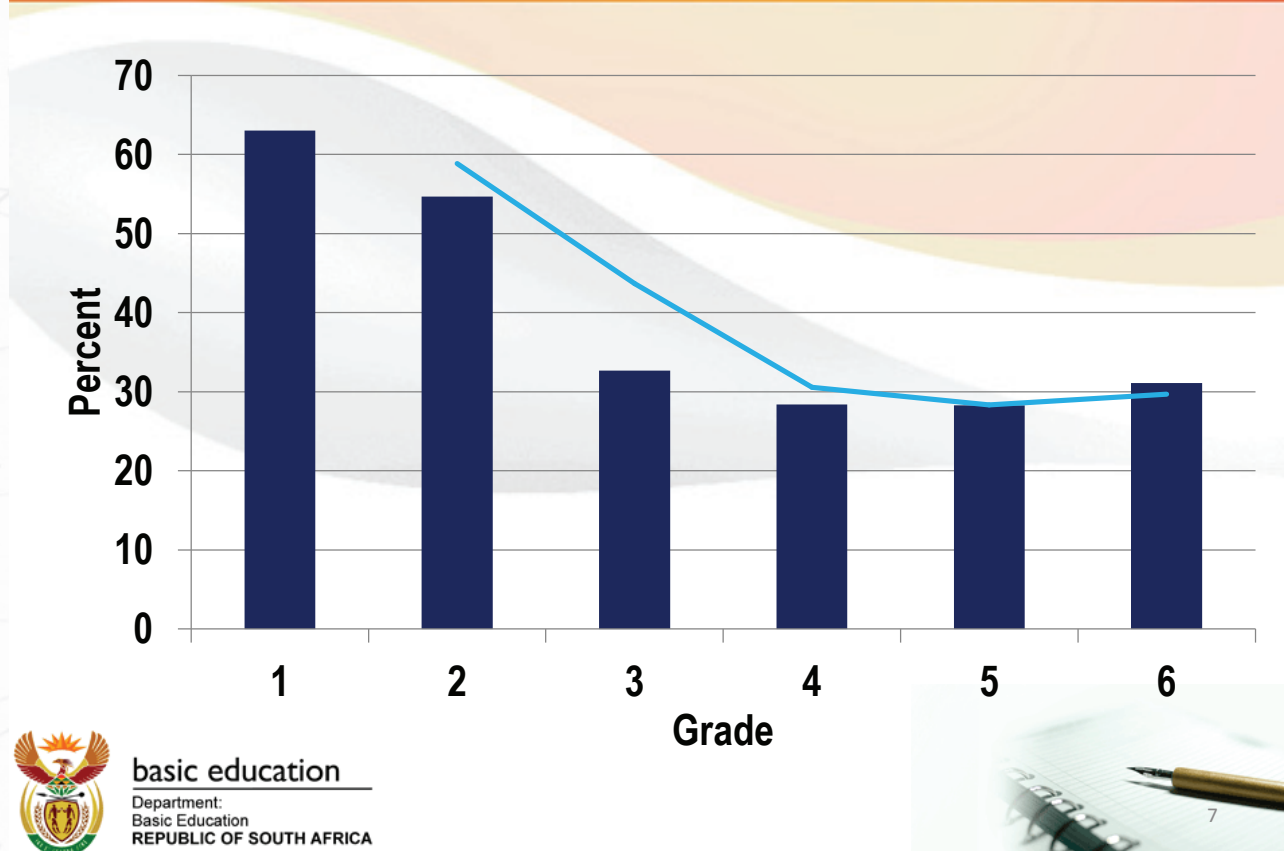


Figure 2: Level, trends & quality of performance: Numeracy

From Figure 2 the average score percentage in mathematics dropped from 63% at Grade 1 to 31% at Grade 6 level. The average score was 28% at both Grades 4 and 5. Like in language, performance in mathematics tended to decline both quantitatively and qualitatively across the grades.

Implications

The analysis of samples of the responses of learners showed that learners moved from one grade to the next without acquiring sufficient basic literacy and numeracy skills.

There is need to strengthen and ensure that work covered in previous grades gets consolidated in the grades that follow. For example, enough time needs to be spent in consolidating work that was covered in Grade 3 at Grade 4, and so forth.

4.2 OVERALL PERFORMANCE OF LEARNERS

Following are the key observations made on the analysis of the overall performance of learners:-

a) Low competency levels in literacy/language basic skills

- i) Learners' hand writing was illegible, even beyond the Foundation Phase. This could be an indication of either insufficient training in this important skill and/or inadequate practice in hand writing/letter formation.
- ii) Lack of basic literacy skills such as correct spelling of frequently-used words, proper use of language forms (e.g. correct use of prepositions, plural forms, tense, opposites, synonyms, etc.) was detected. This could be a result of insufficient vocabulary, which could have arisen from a lack of adequate "reading" and exposure to new words and how they are used.
- iii) Comprehension skills were generally low to poor. In most cases, learners tended to attempt only simple questions, i.e. those that required them to either extract information directly from given text or give short one-word answers. Many of the learners failed to respond to questions that demanded complex skills of inferential reading (reading between the lines), e.g. responses to questions that ask: "**Why?**" (Reasoning); "**What do you think?**" (Inferential reading); "**State in your own words.**" etc. These skills can only be learnt and accumulated from numerous interactions with different types of texts (sustained reading).
- iv) Generally learners showed inadequate ability to write creatively from given prompts (e.g. given a picture and asked to write what one thinks about it) or to transform a given text into another form that requires basic comprehension.
- v) They were not able to read instructions and this could be identified from their responses.

b) Competency in numeracy/mathematics basic skills

- i) Learners demonstrated inability to handle basic numeracy operations of subtraction, multiplication and division that involve whole numbers.
- ii) Learners' conceptions of fractions were seriously limited or distorted. For example learners could not arrange fractions from the smallest to the biggest or vice versa. Inability to do this could be a manifestation of inappropriate methods of introducing the concept of 'fraction' to learners. Lack of understanding of fractions was more pronounced where learners had to operate mixed numbers, like in instances where they had to work with whole numbers and fractions in the same operation, such as in subtracting "three-and-one-quarter" from "five-and-one-eighth" ($5\frac{1}{8} - 3\frac{1}{4}$).
- iii) Responses of learners showed that they were not able to translate word problems into numbers in order to solve them using relevant mathematical techniques. For example, there was general inability to calculate the amount of change a shopper would receive from a specified amount tendered after paying for a number of items whose individual prices were given.

Implications

The problem seemed to have been in learners' development, understanding and working with basic concepts and skills in both literacy and numeracy.

Suggested interventions could include strengthening the following:-

Regular learner assessment to identify learning and teaching "gaps."

Providing learners with a variety of regular practice exercises in both literacy and numeracy.

Regular homework checked and supported at home level.

Teacher support that targets specific curriculum area.

5. ITEM ANALYSIS RESULTS BY GRADE AND SUBJECT

In the first column of each table the focus or domain of assessment has been given, which was basically one broad theme under the subject that was being assessed. The specific skills, knowledge and competencies related to the domain of assessment which were tested have been shown in the second column. In the third column are shown the "levels of difficulty" experienced by learners in each category of skill, knowledge or competency. These levels have been shown as percentages of learners who demonstrated competence in each category of skill, knowledge or competency within the sampled responses. Lower percentages indicate skills, knowledge and competencies that learners experienced as more difficult and vice versa. For instance, a skill or knowledge category in which 21% of the learners demonstrated competence can be interpreted as being more difficult than one in which 49% of the learners were competent.

Each table is followed by comments on typical errors and "knowledge gaps" displayed by the learners in the sample. Finally, proposals for possible interventions have been discussed.

5.1 GRADE 3 LITERACY

5.1.1 READING AND VIEWING

Key findings on “**Reading and viewing**” in literacy at Grade 3 level have been summarised in **Table 5 (a)**.

Table 5 (a): Summary of literacy skills, knowledge and competencies assessed under “Reading and viewing”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Reading and viewing: To what extent were learners able to “read and view” for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts?	make meaning of written text and demonstrate comprehension by combining pieces of information from different parts of a text/story to construct a comprehensive answer.	21
	make meaning of written text and demonstrate this by extracting information (involving an unfamiliar word) directly from the text/story	32
	make meaning of written text and demonstrate this by extracting information (involving a frequently used word) directly from the text/story	40

Table 5 (a) reflects that the percentage of learners who were competent in the different competencies that fell under “**Reading and viewing**” ranged between 21% and 40%.

Comments:-

- Learners were unable to make meaning of written text and demonstrate comprehension by combining pieces of information from different parts of a text/story to construct a comprehensive answer.
- Learners found direct extraction of information from a given text relatively easier than inferring implied meaning, especially if the information was given in frequently used words.

Proposed interventions

- Teachers must expose learners to regular reading of different types of texts individually and in groups. This will increase their confidence in reading, enlarge their vocabulary and promote love for books.
- School Management Teams (SMTs) need to provide class reading corners with materials of varied reading complexities.
- Parents must be encouraged to, and advised on, how to interact with their children’s reading through exercises in workbooks and other reading materials.

5.1.2 WRITING

Under the domain of “**Writing**” learners were asked to write creatively on a given subject using correct language, grammar and punctuation marks. **Table 6 (b)** below shows the summary of how learners performed in this domain.

Table 5 (b): Summary of literacy skills, knowledge and competencies assessed under “Writing”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Writing: To what extent were learners able to write different kinds of factual and imaginative texts for a wide range of purposes?	understand how language is used and demonstrate this by using correct grammatical structures and punctuate sentences appropriately.	26

From **Table 5 (b)** only 26% of the learners in the sample were able to write creatively using correct **grammar, language and punctuation marks**.

Comments:-

- Lack of relevant vocabulary restricted learners' creative writing. Although it was expected that learners in the Foundation Phase would write the tests in Home Language (HL), there were instances where it was evident that a First Additional Language (FAL) was used instead. This choice further complicated the language and vocabulary constraints as can be observed from the typical example of a learner response below.

Typical response showing possible learner lack of vocabulary

12. Write five sentences about how you spend your playtime at school. Use the correct punctuation marks and spelling.

rain
siyadlala
siyathenga
bese siyadla
besengena ema kwasini

In the excerpt above the learner was responding to an English version of the test. Apparently the learner first attempted to respond in the language of the test, e.g. the word “rain” (for “run” or “ran”?). However, the learner apparently ran out of relevant vocabulary and, subsequently, resorted to “code-switching” into a language (isiZulu) in which he/she was obviously better able to express him-/her-self. This can be inferred from the learner's logical and consistent presentation in the isiZulu language.

Implications

The response above has implications for schools in deciding on the language of learning and teaching (LoLT), especially the educational importance of HL use for laying a foundation for learning in the early years.

Proposed interventions

- Teachers must give learners regular writing practice exercises with prompt feedback to help learners develop the necessary writing skills.
- Consistent use of Workbooks will increase the opportunity for learners to receive support from parents on writing.

The best way to improve writing is to **WRITE**.

5.1.3 THINKING AND REASONING

In **Table 5 (c)** a summary of the analysis of responses from the sampled learners on “**Thinking and reasoning**” has been presented.

Table 5 (c): Summary of literacy skills, knowledge and competencies assessed under “Thinking and reasoning”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Thinking and reasoning: To what extent were learners able to use language, as well as to access, process and use information for learning?	use language to describe similarities and differences, and to analyse, compare and contrast information (assessed in the context of comparing the different seasons of the year)	30

From **Table 5 (c)** only 30% of the sampled learners demonstrated competency in using language and appropriate language forms correctly for thinking and reasoning, particularly in terms of making comparisons.

Comments:

- Most learners could not use language creatively to make logical comparisons, i.e. they could not identify one factor or characteristic against which to distinguish similarities and differences among objects or ideas/arguments.

Proposed interventions

- Learners need to be encouraged to answer different types of questions, like **Why?**; “**What do you think?**”, “**What is the difference between?**” as part of class activities.

- When an assessment activity is being done, learners have to be reminded to READ the questions VERY CAREFULLY to think reasonably, to understand and answer sensibly.

In order to encourage thinking and reasoning, learners should be exposed to reading and writing activities on a regular basis. Different texts for reading, to stimulate thinking and reasoning should include notices, invitation cards, greeting cards and time tables

5.1.4 LANGUAGE STRUCTURE

Table 5 (d) below presents a summary of the analysis of responses on tenses and punctuations from the sampled learners.

Table 5 (d): Summary of literacy skills, knowledge and competencies assessed under “Language structure”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Language structure: To what extent were learners able to use the sounds, words and grammar of the language to create and interpret text?	re-write sentences given in the past tense and change them into the <i>future</i> tense correctly.	28
	use punctuations correctly to improve the meaning of a given sentence.	30
	re-write sentences given in the past tense and change them into the <i>present</i> tense correctly.	40

From **Table 5 (d)** the element of language structure that learners found most difficult was re-writing sentences that were given in the past tense and changing these into the future tense. Only 28% of the sampled learners were competent to do so.

Proposed interventions

- Grammar and vocabulary which are the building blocks of language (tenses and punctuations) should be taught in context and integrated with reading, writing, listening and speaking.

5.2 GRADE 3 NUMERACY

5.2.1 NUMBERS, OPERATIONS AND RELATIONSHIPS

The fundamental focus of numeracy at the foundation phase is the ability to understand and handle “Numbers, Operations and Relationships”. A summary of the analysed responses is presented in Table 5 (e).

Table 5 (e): Summary of skills, knowledge and competencies assessed on “Numbers, operations and relationships”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Numbers, operations and relationships:- To what extent were learners able to recognise, describe and represent numbers and their relationships and to count, estimate, calculate and check with competence and confidence in solving problems?	Solve money problems involving totals and change or difference in rands and cents	25
	use appropriate technique(s) to halve numbers.	25
	count forwards in 20s and 25s between 0 and at least 1 000.	29
	perform calculations using appropriate symbols to solve problems involving division of at least whole 2- digit number by 1-digit number.	30
	order and compare fractions including halves, quarters and mixed numbers.	30
	perform calculations, using appropriate symbols, to solve problems involving:- ▪ Addition and subtraction of whole numbers with at least 3 digits. ▪ Multiplication of 2-digit by 1-digit numbers.	35
	use a technique to double numbers.	45
	use appropriate technique(s) to round off in tens	47
	recognise the place value of digits in whole numbers to at least 3-digit numbers	49

From **Table 5 (e)** the percentage of learners who were competent in “Numbers, Operations and Relationships” ranged from 25% to 49%.

Comments:-

- Learners were unable to apply basic numeracy skills to **solve everyday problems such as shopping transactions** that involve determining the amount of change one gets, in rand and cents.
- Learners could not understand verbal interpretation of basic mathematical operations e.g. knowing that to “halve” means to “divide by 2”, to “double” means to “multiply by 2” or add a number to itself.
- Generally, learners’ ability to perform the basic mathematical operations on whole numbers that were made up of more than one digit was very poor and worryingly poor in operations that involved fractions and mixed numbers.
- The majority of learners could not recognise **place values** of digits in numbers with two or more digits

Proposed interventions

- Mental exercises to develop the basic foundational numeracy skills in the early years (the Foundations for Learning Campaign provides guidelines for this) should be engaged in on a daily basis.
- The use of number and name charts and number symbols is also encouraged.
- Linking the challenges identified through ANA to relevant sections in the workbooks that learners use (Integration) is recommended.
- There is need to train learners on basic **counting in multiples** (of 10, 20, 25, etc). This skill is powerful for **early understanding** of basic operations such as addition and multiplication.
- Strengthening teacher support in terms of content knowledge, effective methods of teaching specific aspects of numeracy/mathematics.

5.2.2 PATTERNS, FUNCTIONS AND ALGEBRA

A summary of the analysed responses is presented in Table 5 (f).

Table 5 (f): Summary of numeracy skills, knowledge and competencies assessed under “Patterns, functions and algebra”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Patterns, functions and Algebra:- To what extent were learners able to recognise, describe and represent patterns and relationships as well as to solve problems using algebraic language and skills?	copy and extend simple number sequences	23

From **Table 5 (f)** only 23% of the sampled learners were able to solve problems involving patterns and relationships”.

Comments:-

- Only 23% of the sampled learners were able to write down the next number following a given pattern.

Proposed interventions

- Learners should be taught to build number patterns from small numbers with different operations and progress to large numbers.
- More exposure is needed on number patterns to identify and complete given sequences.

5.2.3 SPACE AND SHAPE

A summary of the analysed responses to questions on “**Space and shape**” is presented in Table 5 (g).

Table 5 (g): Summary of numeracy skills, knowledge and competencies assessed under “Space and shape”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Space and shape:- To what extent were learners able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions?	recognise and describe 3-D objects from different positions.	11
	sort and compare 2-D shapes on 3-D objects in pictures, including: 2-D shapes on the faces of 3-D objects	37

From **Table 5 (g)** the percentage of learners who were competent in “Space and Shape” ranged between 11% and 37%.

Comments:-

- Only 11% of the sampled learners were able to give the number of triangles in a three-dimensional (3-D) figure from different positions.
- Recognising other shapes like cylindrical/cyclic shapes from 2-D or 3-D shapes also presented a challenge to the learners as well.

Proposed interventions

- Practical activities using different shapes can be used to enhance spatial sense in learners.
- Regular high quality school-based assessment in line with national assessment should be **practised**.

5.2.4 MEASUREMENT

Learners were required to work with different units of measurement including time, length and volume. A summary of the responses of the sampled learners is given in **Table 5 (h)**.

Table 5 (h): Summary of numeracy skills, knowledge and competencies assessed under “Measurement”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Measurement:- To what extent were learners able to use appropriate measuring units, instruments and formulae in a variety of contexts?	measure using standard measures for capacity	28
	solve problems involving calculations with and conversions involving years and months	32
	read and write analogue and digital clock time in hours and half-hours	33

From **Table 5 (h)** the percentage of learners who were competent in “**Measurement**” ranged between 28% and 33%.

Comments:-

- Only 28% of the sampled learners were able to perform calculations involving conversion from millimetres to litres.

Proposed interventions

- Teachers must spend more time on area and volume examples with learners and teach them conversions.

5.3 GRADE 4 LANGUAGE

5.3.1 READING AND VIEWING

A summary of the responses of the sampled learners to questions on “Reading and Viewing” is given in **Table 5 (i)**.

Table 5 (i): Summary of literacy skills, knowledge and competencies assessed under “Reading and Viewing”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Reading and viewing To what extent were learners able to read and view information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts?	make meaning of written text and demonstrate comprehension by combining pieces of information from different parts of a text/story to construct a comprehensive answer and give reasons.	49
	make meaning of written text and demonstrate by extracting information directly from the text/story	49

From **Table 5 (i)** the percentage of sampled learners who were competent in “Reading and Viewing” was 49%.

Comments:-

- Most learners could only answer questions that required direct extraction of a single-word or a short-phrase from the given text without any motivation or supporting statement.
- Learners demonstrated lack of comprehension and reading skills.

Proposed interventions

- Learners should be trained on how to read text or paragraph with understanding so that they can be able to process information and answer questions from any written passage.

5.3.2 LANGUAGE STRUCTURE AND USE

In **Table 5 (j)** a summary of the analysis of responses from the sampled learners on “**Language Structure and Use**” has been presented.

Table 5 (j): Summary of skills, knowledge and competencies assessed under “Language structure and use”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Language structure and use. To what extent were learners able to use words and grammar of the language to create and interpret texts?	re-write sentences given in the past tense and change them into the <i>present</i> tense correctly	8
	re-write sentences given in the past tense and change them into the <i>future</i> tense correctly	15
	use prepositions correctly to improve the meaning of a given sentence	27

From **Table 5 (j)** the percentage of sampled learners who were competent in “Language structure and use” ranged between 8% and 27%.

Comments:-

- The majority of the learners could not differentiate among tenses. The worst performance in this regard was observed when they had to change past to present and continuous tenses.
- They also demonstrated very poor performance in using appropriate prepositions in sentences.

Proposed interventions

- Teachers should engage learners in grammar exercises every week that will capture all aspects of language structures.

5.3.3 WRITING

Table 5 (k) presents a summary how learners performed in “Writing”.

Table 5 (k): Summary of literacy skills, knowledge and competencies assessed under “Writing”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Writing To what extent were learners able to write different kinds of factual and imaginative texts for a wide range of purposes?	use correct grammar and spelling when constructing sentences	32

From Table 5 (k) the percentage of sampled learners who were competent in “Writing” was 32%.

Comments:-

- There was general lack in basic literacy skills, including correct spelling of frequently used words and basic grammar.

Typical response of learners on plurals:

17. Write only the plural of the underlined word.

17.1 The child could not catch the bus. (1)

The childrens play could not catch the bus

17.2 He put his foot on the bus seat. (1)

He put his footing on the bus seat

17.3 They left for Durban to play soccer. (1)

They left for Durban to play soccers

Comments:

Familiar nouns such as “child”, “foot”, “soccer” etc which have plurals that are unfamiliar, need to be specially taught to users of English as First Additional Language (FAL)

Proposed interventions

Subject advisors need to train Grade 4 teachers in the most effective methods of teaching a First Additional Language.

5.3.4 THINKING AND REASONING

Table 5 (I) presents a summary of the analysed responses to the questions on “Thinking and Reasoning”

Table 5 (I): Summary of literacy skills, knowledge and competencies assessed under “Thinking and reasoning”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Thinking and reasoning To what extent were learners able to use language to think and reason, as well as to access, process and use information for learning?	use language to respond to simple questions about a story and give reasons that support one’s answer	12
	Use own opinion and give reasons for the answer	16

From **Table 5 (I)** the percentage of learners who were competent in “Thinking and reasoning” ranged between 12% and 16%.

Comments:-

- Many learners displayed a limited knowledge on how to read a text with understanding and process information from the text.
- In many instances learners demonstrated lack of vocabulary and reading skills where they had to express their opinions and give reasons.

5.4 GRADE 4 MATHEMATICS

5.4.1 NUMBERS, OPERATIONS AND RELATIONSHIPS

A summary of learner responses to questions on “Numbers, Operations and Relationships” has been presented in Table 5 (m).

Table 5 (m): Summary of skills, knowledge and competencies assessed under “Numbers, Operations and Relationships”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Numbers, operations and relationships: To what extent were learners able to recognise, describe and represent numbers and their relationships and to count, estimate, calculate and check with competence and confidence in solving problems?	count forwards and backwards in whole number intervals and fractions.	34
	perform calculations using appropriate symbols to solve problems involving division of at least whole 4-digit number by 1-digit number	40
	perform calculations, using appropriate symbols, to solve problems involving:- <ul style="list-style-type: none"> Addition and subtraction of whole numbers with at least 4 digits. Addition of mixed numbers Multiplication of 3-digit by 2-digit numbers. 	40
	recognise the place value of digits in whole numbers to at least 4-digit numbers	49

From **Table 5 (m)** the percentage of learners who were competent in “Numbers, Operations and Relationships” ranged between 34% and 49%.

Comments:-

- Most learners could not add mixed numbers (whole numbers and fractions). They added numerators or denominators in the same way as they would handle whole numbers.
- Poor performance in Numbers, operations and relationships observed in the Foundation Phase was observed in Grade 4 as well. This presents a serious challenge as these are the basic foundational skills in Numeracy/Mathematics.

Typical learner response on addition of mixed numbers:

4.5

$$7\frac{1}{2} + 10\frac{1}{2} + \frac{3}{4}$$

$$\begin{array}{r} 17 \\ + 5 \\ \hline 22 \end{array} \quad (3)$$

In the typical learner response above the learner had to add two mixed numbers and a simple fraction. The learner then proceeded as follows:

- a) Added the whole numbers $7 + 10 = 17$,
- b) Added the numerators of all the fractions: $1 + 1 + 3 = 5$,
- c) Then added the sum from a) to the sum from b): $17 + 5 = 22$

Proposed interventions

- Proceeding from the concrete to the abstract, learners must be taught the conceptual understanding of fractions, using real objects before they are introduced to “algorithms” or memorised formulae.

5.4.4 PATTERNS, FUNCTIONS AND ALGEBRA

Learners were required to solve problems involving “**Patterns, Functions and Algebra.**” A summary of the analysed responses has been presented in **Table 5 (n)**.

Table 5 (n): Summary of mathematics skills, knowledge and competencies assessed under “Patterns, functions and algebra”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Patterns, functions and algebra:- To what extent were learners able to recognise, describe and represent patterns and relationships as well as to solve problems using algebraic language and skills?	solve or complete number sentences by inspection or by trial-and-improvement, checking the solution by substitution.	28
	copy and extend numeric patterns looking for a relationship or rules, including patterns not limited to sequences involving constant difference.	34

From **Table 5 (n)**, only 28% of the sampled learners were able to solve problems by substitution while 34% could solve numeric patterns.

Comments:-

- Many learners could not identify a number pattern in a sequence that involved fractions. The underlying factor seemed to be inadequate conceptualization of a “fraction and how fractions are represented in written forms, e.g. what does a “numerator” stand for? What does a “denominator” stand for?

5.4.5 SPACE AND SHAPE

Learners were required to describe properties of three-dimensional shapes/objects and solve problems. In Table 5 (o) presents a summary of the analysis of learner responses from the sampled learners.

Table 5 (o): Summary of mathematics skills, knowledge and competencies assessed under “Space and Shape”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Space and shape:- To what extent were learners able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions?	recognise and describe 3-D objects from different positions.	41
	describe, sort and compare two-dimensional and three-dimensional objects from the environment according to geometrical properties including shapes of faces, number of faces, flat and curved surface, straight and curved sides	45

From **Table 5 (o)** the percentage of learners who were competent in “Space and Shape” ranged between 41% and 45%.

Comments:-

- “Space and shape” is an important domain in mathematics. It is introduced quite early in school and should be consolidated continuously as learners progress from grade to grade.

5.4.6 MEASUREMENT

Learners were required to work with different units of measurement including time and length. **Table 5 (p)** presents a summary of the responses of the sampled learners.

Table 5 (p): Summary of mathematics skills, knowledge and competencies assessed under “Measurement”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Measurement: To what extent were learners able to use appropriate measuring units, instruments and formulae in a variety of contexts?	solve problems involving calculations with and conversions involving metres and kilometres	15

From **Table 5 (p)** only 15% of the sampled learners were competent in measurement involving conversions between units of length.

Comments:-

- Learners need regular practice with technical exercises such as conversion from one unit to another. Only practice can help them “perfect” these kinds of skills

5.5 GRADE 5 LANGUAGE

5.5.1 THINKING AND REASONING

Learner competence on the use of language to think and reason is summarised in Table 5 (q).

Table 5 (q): Summary of skills, knowledge and competencies assessed under “Thinking and reasoning”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Thinking and reasoning To what extent were learners able to use language to think and reason, as well as to access, process and use information for learning?	answer simple questions that respond to emotions from a story	11
	make meaning of written text and demonstrate this by extracting information (involving a frequently used word) directly from a text/story	32

From **Table 5 (q)**, learner competency ranged between 11% and 32%.

Comments:-

- The mistakes in the learners’ response often demonstrated that the learners did not understand the question or they could not read.

5.5.2 LANGUAGE STRUCTURE AND USE

Table 5 (r) presents a summary of the analysis of responses from the sampled learners on “**Language structure and use**”.

Table 5 (r): Summary of language skills, knowledge and competencies assessed under “Language structure and use”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Language structure and use. To what extent were learners able to use the sounds, words and grammar of the language to create and interpret texts.	re-write sentences given in the past tense and change them into the <i>present</i> tense correctly	20
	re-write sentences given in the past tense and change them into the <i>future</i> tense correctly	32
	re-write sentences given in the present tense and change them into the <i>past</i> tense correctly	41
	write opposites of the given words	44

From **Table 5 (r)**, learner competency ranged between 20% and 44%.

Proposed interventions:

- Regular exercises in language use will expose learners to different forms, structures and grammatical conventions in the language concerned.
- The exercises should include speaking, listening and writing in order to deepen understanding.

5.5.3 THINKING AND REASONING

Table 5 (s) presents a summary of the responses of learners to questions on “**Thinking and reasoning**” has been presented in

Table 5 (s): Summary of language skills, knowledge and competencies assessed under “Thinking and Reasoning”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Thinking and reasoning To what extent were learners able to use language to think and reason, as well as to access, process and use information for learning?	use language to make comparisons, reasoning and to analyse information.	44

From **Table 5(s)** only 44% of the sampled learners were competent.

Comments:-

- In this particular case, learners were given a schedule (tabulated information) showing the times of “departure” and “arrival” of a bus at a particular station. Learners were asked questions that required them to interact with the schedule but present their answers in written form.
- The ability to access information and present it in different forms (e.g. tables, charts, graphs etc) is an important analytical skill that must be inculcated in learners.

Implications

There is basic lack of comprehension which seems to be the pervasive problem in the English language in our schools.

5.6 GRADE 5 MATHEMATICS

5.6.1 NUMBERS, OPERATIONS AND RELATIONSHIPS

Table 5 (t) presents a summary of how learners responded to questions on the domain of “**Numbers, Operations and Relationships**” in Grade 5.

Table 5 (t): Summary of skills, knowledge and competencies assessed and how learners experienced these under “Numbers, operations and relationships”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Numbers, operations and relationships:- To what extent were learners able to recognise, describe and represent numbers and their relationships and to count, estimate, calculate and check with competence and confidence in solving problems?	solve problems involving comparing quantities of different kinds e.g. ratio.	8
	perform calculations, using appropriate symbols, to solve problems involving subtraction of whole numbers with at least 5 digits.	15
	calculate by selecting and using operations appropriate to solving problems that involve equivalent fractions	20
	use appropriate technique(s) to round off in tens	20

From **Table 5 (t)** the percentage of learners who were competent in “Numbers, operations and relationships” ranged from 8% to 20%.

Comments:-

- Generally, learners displayed a lack of basic fundamental skills of doing calculations using the four basic operations of addition, subtraction, multiplication and division of numbers.

5.6.2 SPACE AND SHAPE

Table 5 (u) presents a summary of the responses of the learners to questions on “Space and shape”.

Table 5 (u): Summary of skills, knowledge and competencies assessed and how learners experienced these under “Space and shape”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Space and shape:- To what extent were learners able to describe and represent characteristics and relationships of two-dimensional shapes?	compare two-dimensional shapes by drawing shapes on grid paper	31

From Table 5 (u) the percentage of learners who were competent in “Space and shape” was 31%.

Comments:-

- The “**Space and Shape**” domain in mathematics offers unique opportunities for learners to exercise and develop manipulative skills such as drawing and measuring. These skills in turn help learners develop a deeper conceptual understanding

5.6.3 MEASUREMENT

Learners were assessed on doing calculations that involve specific formulae and conversions of familiar units of measurement. Learner performance in this focus area is summarised in Table 5 (v).

Table 5 (v): Summary of skills, knowledge and competencies assessed and how learners experienced these under “Measurement”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Measurement: To what extent were learners able to use appropriate measuring units, instruments and formulae in a variety of contexts?	solve problems involving calculation and conversion between appropriate capacity units.	17
	calculate the area of rectangles and squares using square grids.	19
	solve problems involving calculation and conversion between appropriate time units.	25

From Table 5 (v) the percentage of learners who were competent in “Measurement” ranged between 17 % and 25%.

Implications

Proposed interventions

- Teachers should provide multiple opportunities for learners to experience hands-on tasks where they use easily available instruments such as rulers and scales to measure quantities such as length, height, depth, volume, using objects of different shapes, sizes, weight, etc.
- They should then use the data that they themselves have generated to do various kinds of calculations that involve conversions of units from small to larger units and vice versa. In this exploration process, learners must be helped to get a sense of what is involved in terms of measuring instruments and units. In measuring the smaller objects they can see and handle in the classroom to measuring massive bodies like planets and stars! The domain of “**Measurement**” provides opportunity for manipulative skills and conceptual understanding to be developed in an integrated fashion.

5.7 GRADE 6 LANGUAGE

5.7.1 READING AND VIEWING

In **Table 5 (w)** a summary of the analysis of responses from the sampled learners on “**Reading and viewing**” has been presented.

Table 5 (w): Summary of skills, knowledge and competencies assessed and how learners experienced these under “Reading and Viewing”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Reading and viewing: To what extent were learners able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in texts?	understand reasons for what is taking place in a story	23
	identify and discuss some issues in a story	28
	ability to reason why things took place	37
	understand the meaning of words and/or expressions used in the text	38
	describe what is taking place in the plot	40
	understand title, setting and plot (e.g. says why things happened in the way they did)	43
	describe feelings and talk about reasons for their actions	45

From **Table 5 (w)** the percentage of learners who were competent ranged between 23% and 45%.

Comments:-

- A large number of learners could either not read the questions at all or did not understand what was asked of them (reading with comprehension). As indicated elsewhere in this report, learners demonstrated

very superficial levels of reasoning complexity, e.g. ability to extract information directly from the text but unable to infer implied meaning by linking parts in a written text (“reading between the lines”).

- Meaningful “Reading” is a skill that does not come naturally. Learners need to be instructed and trained on how to read meaningfully.

5.7.2 WRITING

Table 5 (x) presents a summary of how learners performed in the “Writing” domain has been given in

Table 5 (x): Summary of language skills, knowledge and competencies assessed under “Writing”.

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Writing: To what extent were learners able to write different kinds of factual and imaginative texts for a wide range of purposes?	read a story and be able to write an introduction or ending	5
	write for social purposes	35

From **Table 5 (x)** the sampled learners demonstrated competency in writing ranging from 5% and 35%.

Comments:-

- Inability to read questions and lack of appropriate vocabulary seemed to be the main barrier to effective learning. Regular reading is critical to overcome these barriers

5.7.3 THINKING AND REASONING

Table 5 (x) presents a summary of how learners performed in the “Thinking and Reasoning” domain.

Table 5 (y): Summary of language skills, knowledge and competencies assessed under “Thinking and Reasoning”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Thinking and reasoning:- To what extent were learners able to use language, as well as to access, process and use information for learning?	design posters and chart	36

From **Table 5 (y)** only 36% of the sampled learners demonstrated competencies in “Thinking and reasoning”.

5.7.4 LANGUAGE STRUCTURE AND USE

Table 5 (z) presents a summary of the analysis of responses from the sampled learners on “**Language structure and use**”.

Table 5 (z): Summary of language skills, knowledge and competencies assessed under “Language structure and use”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Language structure and use:- To what extent were learners able to use the sounds, words and grammar to create and interpret texts?	use correct form of words.	19
	use tenses correctly.	25
	identify singular and plural forms of words.	35
	identify opposites and synonym forms.	38

From **Table 5 (z)** the learner competency of the sampled learners ranged between 19% and 38%.

Comments:-

- Most learners displayed very little understanding of the fact that words like verbs take different forms in different contexts, to reflect, for instance, tense, plural or singular forms. This was particularly the case with the majority of learners who responded in English.

5.8 GRADE 6 MATHEMATICS

5.8.1 NUMBERS, OPERATIONS AND RELATIONSHIPS

The fundamental focus of numeracy/ mathematics at the foundation phase is the ability to understand and handle “**Numbers, operations and relationships**”. A summary of the analysed responses is presented in Table 5(aa).

Table 5 (aa): Summary of skills, knowledge and competencies assessed and how learners experienced these in “Numbers, operations and relationships”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Numbers, operations and relationships:- To what extent were learners able to recognise, describe and represent numbers and their relationships and to count, estimate, calculate and check with competence and confidence in solving problems?	find correct equivalent fractions of decimal numbers	13
	find percentage of a number	14
	add mixed numbers.	15
	divide a 4-digit number by a 2-digit number (using long division).	16
	solve word problems using rate	17
	perform calculations that involve mixed operations	18
	subtract mixed numbers	19
	round off to the nearest 1000.	31
	round off to the nearest 100.	34
	find factors of a composite number	41
	identify prime numbers.	42

From **Table 5 (aa)** the percentage of learners who were competent in “Numbers, operations and relationships” ranged from 13% to 42%.

Comments:-

- The competencies listed in Table 5 (aa) – from the most difficult to the least difficult – are very specific and should be taught and assessed on a regular basis. They are critical to learning mathematics. More examples of these will be found in the Workbooks.

5.8.2 PATTERNS, FUNCTIONS AND ALGEBRA

A summary of the analysed responses to “Patterns, functions and algebra” is presented in Table 5 (ab).

Table 5 (ab): Summary of skills, knowledge and competencies assessed and how learners experienced these in “Patterns, functions and algebra”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
<u>Patterns, functions and algebra</u> To what extent were learners able to recognise, describe and represent patterns and relationships as well as to solve problems using algebraic language and skills?	solve word problems using rate.	9
	write a number sentence for a word problem.	23
	solve number sentences.	27
	solve or completes number sentences (by trial and improvement, inspection, etc.).	41
	solve or completes geometric patterns (by trial and improvement, inspection, etc.).	45

From **Table 5 (ab)** the percentage of learners who were competent in “Patterns, functions and algebra” ranged from 9% to 45%.

Comments:-

- Solving word problems was the most difficult skill experienced by learners. This skill requires learners to identify patterns and find “functions” that link several entities, e.g. what “function” links the unit price to the number of items that one can purchase in a shop? The process of getting the answer involves calculations (algebra) that learners must practise daily.

5.8.3 SPACE AND SHAPE

Table 5 (ac) presents a summary of the analysed responses to the questions on “Space and Shape”.

Table 5 (ac): Summary of skills, knowledge and competencies assessed and how learners experienced these in “Space and shape”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Space and shape:- To what extent were learners able to describe and represent characteristics and relationships between two-dimensional shapes and three-dimensional objects in a variety of orientations and positions?	describe properties of 2-D shapes and 3-D objects.	28
	identify and name 3-D objects and shapes.	32
	solve problems involving 2-D shapes and 3-D objects in terms of geometric properties	45

From **Table 5 (ac)** the percentage of learners who were competent in “Space and shape” ranged from 28% to 45%.

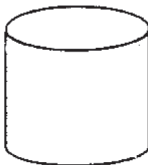
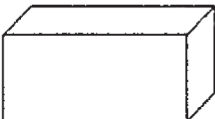

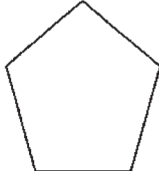




Comments:-

- In general learners seemed to perform better in tasks that involved 2-dimensional shapes than if 3-dimensional objects were involved or presented on a page. The typical learner responses below illustrate this limitation in spatial visualisation learners.

Typical learner response on identification of 2-D shapes and 3-D objects:

20. Write down the name of each figure in the spaces below.

(4)

			
circle 	rectangle 	hexagon 	pentagon 
20.1	20.2	20.3	20.4

2

5.8.4 MEASUREMENT

Table 5 (ad) presents a summary of the analysed responses to the questions on “**Measurement**”.

Table 5 (ad): Summary of skills, knowledge and competencies assessed and how learners experienced these in “Measurement”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Measurement: To what extent were learners able to use appropriate measuring units, instruments and formulae in a variety of contexts?	calculate the area of rectangles and squares using square grids.	28
	solve problems involving calculation and conversion between appropriate time units.	30

From **Table 5 (ad)** the percentage of learners who were competent in “Measurement” ranged from 28% to 30%.

Comments:-

- Regular practice with measurements and calculations that involve a wide range of units and instruments could improve the performance of learners in this domain..

5.8.5 DATA HANDLING

Table 5 (ae) presents a summary of the analysed responses to the questions on “**Data handling**”.

Table 5 (ae): Summary of skills, knowledge and competencies assessed and how learners experienced these in “Data handling”

Focus/domain of assessment	Specific skills/ knowledge/ competencies assessed Testing whether the learner is able to ...	% learners showing competence
Data handling: To what extent were learners able to interpret and represent data?	draw a variety of graphs (pictographs/ bar groups/ double bar graphs) to display and interpret information.	27
	predict the likelihood of events from daily life on a scale from ‘impossible’ to ‘certain’.	34
	examine ungrouped data in terms of mode and median.	36

From **Table 5 (ae)** the percentage of learners who were competent in “Data handling” ranged between 27% and 36%.

Comments:-

- Learners displayed general and specific misinterpretations of important concepts in data handling. The concept of ratio was generally confused with operations such as addition rather than comparison as can be seen from the typical learner response below.

Typical learner response on ratio:

23. Nobese has 3 black, 4 red, 2 blue and 3 green balls in a bag



23.1 The ratio of blue balls to green balls = 5 x (2)

Apparently the learner simply added the 2 blue balls to the 3 green balls to get “5” as an answer. Teachers’ awareness of the existence of such misconceptions among learners would be a good starting point for him/her to seek effective strategies of teaching relevant mathematical concepts.

6 CONCLUSION AND RECOMMENDATIONS

This is the report of a qualitative analysis of the manner in which representative samples of all learners who wrote the ANA of 2011 performed. Among other things, it has identified many challenges which DBE would need to address. The extent to which it found particular knowledge and skills difficult to master was estimated through the percentage of learners who gave acceptable responses to test questions in literacy/language and numeracy/mathematics. The percentage of learners who demonstrated acceptable competencies in the various domains and across all the grades, ranged between 10 to 49 percent, certainly below 50%

Detailed analysis of what learners could or could not do in the tests showed common trends across the grades and across the subjects. The majority of learners seemed not to be developing beyond elementary levels of knowledge and skills. In literacy/language this meant that learners attempted questions that required direct extraction of information from given texts but could not make meaningful inferences by linking different parts of a given text. The learners concerned displayed unacceptably low levels of reading with the required comprehension across the grades.

Numeracy scores were lower than those of other subjects. Again the majority of learners who attempted questions that involved basic mathematical operations but demonstrated very serious conceptual shortcomings in higher order skills. The domains in which learners displayed most serious weaknesses included fractions, patterns and mathematical functions, data handling and measurement.

Typical responses of learners were presented to illustrate the nature and extent of the problem involved, where appropriate. In many instances suggestions were made on what could be done. It must be emphasised that

such suggestions could never be exhaustive. They are simply some of the ideas which teachers could include in their repertoire of teaching strategies.

Mainly, this analysis highlighted the fact that, the majority of the learners who wrote the 2011 ANA displayed inability to read and were thus not able to read questions with enough understanding to respond. In addition, many of those who could read seemed to be constrained by limited vocabulary to write creatively and express their opinions freely where this was required.

It was also noted that many learners' handwriting was illegible, suggesting that the important skill of handwriting or letter formation was not practised sufficiently. For many of the evident poor performance by some learners, recommendations have been made to the effect that more practice was needed to improve literacy skills and regular mental exercises to develop basic numeracy/mathematics and literacy/language competencies.