

# **INTEGRATED EDUCATION PROGRAMME**

## **Report: Baseline Testing of Grades 3 and 6 Learners in Integrated Education Programme Schools**

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## ACRONYMS AND ABBREVIATIONS

2-D	Two dimensional
3-D	Three dimensional
AIDS	Acquired Immunodeficiency Syndrome
AS	Assessment Standard/s
Btw	Between
DDSP	District Development Support Programme
DO	District Official
DoE	Department of Education
EC	Eastern Cape [province]
Gr	Grade
HIV	Human Immunodeficiency Virus
IEP	Integrated Education Programme
JET	JET Education Services
KZN	KwaZulu Natal [province]
LA	Learning Area
LIMP	Limpopo [province]
LO	Learning Outcome
LOLT	Language of Learning and Teaching
NC	Northern Cape [province]
NGO	Non-government Organisation
No.	Number
RNCS	Revised National Curriculum Statement
RTI	Research Triangle Institute
SA	South Africa
SACMEQ	Southern and East African Consortium for the Monitoring of Educational Quality
SPSS	Statistical Package for the Social Sciences
Std.	Standard
USAID	United States Agency for International Development
vs.	versus

## EXECUTIVE SUMMARY

The aim of the baseline testing is to provide baseline information on the performance of Grades 3 and 6 learners in Literacy, Numeracy/Mathematics and Science in a sample of Integrated Education Programme (IEP) schools.

Due to a delay in the testing programme, it was decided to test Grades 4 and 7 learners; the assumption being made was that, at the start of the new school year, the knowledge of these learners is equivalent to that of Grade 3 and Grade 6 learners, respectively, at the end of the previous school year. Subsequent testing will, therefore, compare the baseline results with those of Grades 3 and 6 learners at the end of the year.

The Literacy, Numeracy/Mathematics and Science tests were constructed using the Learning Outcomes (LOs) and Assessment Standards (AS) specified in the Revised National Curriculum Statements (RNCS). The tests were administered to a group of approximately 25 randomly sampled learners per grade in each of the sampled IEP and non-IEP control schools (unless there were less than this number of Grades 3 and 6 learners in the school). These are pencil-and-paper tests designed to be completed by average learners in 90 minutes. In practice the majority of learners would take considerably longer to complete the instruments. In the baseline, the learners were required to write two tests: in Grade 4 the learners had to write a Numeracy test first and a Literacy test in the second session. Similarly, Grade 7 learners first wrote the Mathematics paper and then Science. A 30 minute break was given between sessions. The fact that so many of the learners were not capable of completing a test within the allotted time points to a serious problem within South African schooling. It shows that learners are not performing to the standards expected by the curriculum.

It was abundantly clear, both to the fieldworkers administering the tests, and to the scorers marking them, that not only have most learners little or no experience in writing tests of this kind, but that their inability to engage with them is greatly exacerbated by very poor reading skills.

Project schools tested were drawn by means of a stratified random sample from the total of 637 programme schools. The stratification was based on the IEP categories of schools, namely Poor Performing (PP), Better Performing (BP) and the first group of First Time New Primaries (FT). Fifty-seven schools were tested, which constitutes 8.7% of the IEP schools. The control schools were selected through purposive sampling methods, where the main criterion was that schools should be non-IEP schools of the same socio-economic standing as IEP schools. Nine schools were tested, and this constituted 1.3% of the total IEP schools.

The Literacy and Numeracy instruments were administered to Grade 4 learners, and the Mathematics and Sciences instruments to Grade 7 learners. The results are presented by group (project vs. control), by IEP cohort, by province, by district, by gender, and by knowledge/skill domain.

Performance by individual schools is not discussed in any detail in this report. However, the overall performance for each school is appended hereto (Appendix A). This information will be sent to district offices, which will then disseminate individual school reports to the schools in their districts. The school information will also be shared with the relevant service providers.

The main findings of the testing process are presented below.

**Performance indicator by group**

Learning Area	Group	Baseline result	Were differences statistically significant?
Grade 3 Numeracy	Project	26%	Yes
	Control	24%	
Grade 3 Literacy	Project	42%	No
	Control	46%	
Grade 6 Mathematics	Project	23%	No
	Control	24%	
Grade 6 Science	Project	25.5%	No
	Control	25.9%	

**Performance indicator by gender (project schools only)**

Learning Area	Gender	Baseline result	Were differences statistically significant?
Grade 3 Numeracy	Female	26%	No
	Male	25%	
Grade 3 Literacy	Female	43%	No
	Male	42%	
Grade 6 Mathematics	Female	22.8%	No
	Male	23.2%	
Grade 6 Science	Female	26%	No
	Male	25%	

**Performance indicator by IEP cohort classification (project schools only)**

Learning Area	IEP cohort classification	Baseline result	Were differences statistically significant?
Grade 3 Numeracy	Cohort 1: BP	31%	- Btw BP & FT: No - Btw PP & FT: No - Btw BP & PP: Yes
	Cohort 2: PP	25%	
	Cohort 3: FT	26%	
Grade 3 Literacy	Cohort 1: BP	43%	- Btw BP & FT: No - Btw PP & FT: No - Btw BP & PP: No
	Cohort 2: PP	42%	
	Cohort 3: FT	43%	
Grade 6 Mathematics	Cohort 1: BP	27%	- Btw BP & FT: Yes - Btw PP & FT: Yes - Btw BP & PP: No
	Cohort 2: PP	23%	
	Cohort 3: FT	20%	
Grade 6 Science	Cohort 1: BP	29%	- Btw BP & FT: Yes - Btw PP & FT: Yes - Btw BP & PP: No
	Cohort 2: PP	26%	
	Cohort 3: FT	23%	

### **Performance indicator by province (project schools only)**

<b>Learning Area</b>	<b>Province</b>	<b>Baseline result</b>
Grade 3 Numeracy	EC	30%
	KZN	26%
	Limp	24%
	NC	24%
Grade 3 Literacy	EC	48%
	KZN	40%
	Limp	39%
	NC	44%
Grade 6 Mathematics	EC	21%
	KZN	21%
	Limp	25%
	NC	24%
Grade 6 Science	EC	25%
	KZN	24%
	Limp	27%
	NC	26%

In the **Grade 3 Numeracy tests**, the mean score correct for project schools was 26% and 24% in control schools. Of the provinces, Eastern Cape performed the best overall with a performance rate of approximately 30%. In relation to LO1, project schools scored poorly in division, with an overall 12% result, while control schools scored an overall 11% result for this skill. Overall, female learners scored slightly higher than males. The differences between the 27% for female learners and 26% for males was not statistically significant.

In the **Grade 3 Literacy test**, the Eastern Cape performed slightly better than the other provinces, with a performance rate of 48%. Northern Cape followed at 44% and Limpopo and KZN achieved the lowest performance rates at 39% and 40% respectively. Female learners performed slightly better than males, with average scores around the 43% mark; male learners performed on average around the 42% mark. Again, this difference is not statistically significant. Thinking and reasoning, and writing were the Literacy skills that project school learners answered least well.

In the **Grade 6 Mathematics test**, project schools obtained an overall mean score of 25%. Control schools once again slightly outperformed project schools at baseline with an overall mean score of 29%. A disaggregation of the results by province revealed that Limpopo performed favourably in relation to the other provinces, with an overall mean score of 27%. Northern Cape followed with 26% and Eastern Cape performed least well with an overall performance rate of 22%. Learners performed least well in relation to the following skills:

- For LO1, rounding off, decimals and percentages, and ordering fractions – where mean scores for these items were all below the 20% mark.
- For LO2, geometric patterns and equations – where scores of less than 30% were achieved.
- In terms of LO3, 2-D shapes, 3-D objects and perspective also saw scores of less than 30%, particularly on items that dealt with 3-D objects and transformations – where mean scores were lower than 16%.

- Learners did the least well in LO4 skills, especially mass and capacity – where mean scores were also lower than 16%. Both male and female learners performed overall at around the 23% mark.

In the **Grade 6 Science test**, project schools overall obtained a 25.5% mean score, while control schools obtained a 25.9% result. Limpopo and Northern Cape performed the best with overall scores of just over 26%. KZN performed least well of the four provinces in this Learning Area (LA). In terms of Science LOs, LO3 (i.e. Science, Society and Environment) was answered least well by learners overall. This LO required learners to apply knowledge of Science to everyday life. Project school learners obtained a 13% result overall for this LO, while control schools obtained a 14% result overall. LO1 (i.e. Investigations) and LO2 (i.e. Constructing Scientific Knowledge) were also not answered well by learners. Project schools obtained a 27% mean score for LO1 and 26% for LO2, while control schools achieved a mean score of 25% for LO1 and 28% for LO2.

Attention is drawn to the fact that all results across the Numeracy, Mathematics and Science LAs seldom exceeded the 30% mark. This is cause for concern, particularly as learners in Grade 4 or 7 were tested on the knowledge and skills of the grade they had passed in the previous year. For Literacy, the mean score did not exceed 45%.

The analysis also looked at the number of learners who achieved a benchmark of 50% or more for each of the skill areas, on the assumption that, if classes were performing according to expectations, than the majority of learners would be achieving this benchmark. For Grade 3 Numeracy, only 10% of learners who were tested attained this benchmark, while for Grade 6 Mathematics, fewer than 3% of learners attained this mark. For Grade 3 Literacy, 38% of the learners accomplished a score of 50% or more. For Science, only 8% of Grade 6 learners achieved mean scores of 50% or more. The analysis provides a great deal of detail regarding performance in a number of skills specified in the curriculum.

There is no doubt that the most fundamental problem in all the schools observed is the very poor levels of reading exhibited by the learners. No progress will be possible in addressing shortcomings in Mathematics and Science, or in any other subject for that matter, until reading proficiency is significantly improved. Thus, the first priority for the IEP must be to institute a comprehensive programme for improving reading and writing.

A second fundamental problem lies in learners' poor understanding of the number system, and their inability to progress from the concrete methods appropriate to Grade 1 to an abstract understanding of numbers. Thus, in adding 35 + 46, for example, learners will draw 35 marks on the page, followed by 46 marks, and will then proceed to count the total. The majority of higher order mathematical concepts in the primary school are founded on a good understanding of the number system, and a facility in performing simple algorithms, without resorting to concrete methods. Thus, a second priority for the IEP must be to develop a facility with the fundamental arithmetic operations.

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# CHAPTER ONE

## INTRODUCTION & RESEARCH DESIGN

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# 1. BACKGROUND TO THE EVALUATION

## 1.1 Introduction

Learner testing serves to assess the health of any education system and to benchmark changes in the functionality of the system over time. In a project context, learner testing is ideally administered at three stages:

- At baseline stage, diagnostic testing provides donors, Department of Education officials and implementers with information regarding the level at which learners are performing prior to project intervention, which informs the type of interventions required;
- At mid-term testing stage, the same target audience is able to get information regarding the impact of the intervention and is thus able to make informed decisions aimed at improving the interventions; and
- At final testing stage, learner testing may establish the summative impact of the project on learner performance, thus enabling participants to identify good practices for purposes of replication and sustainability.

The overall goal of the IEP is “improved learner performance in Numeracy, Literacy, Mathematics and Science in participating schools”. The specific objectives are:

- Improved learner results in Literacy, Numeracy/Mathematics and Science;
- Enhanced capacity of educators (targeted to the teaching of Literacy, Numeracy, Mathematics and Science);
- Effective implementation of the RNCS with a focus on the teaching of Literacy, Numeracy/Mathematics and Science curricula;
- Improved educational management and enhanced school governance;
- Integration of HIV and AIDS issues into the curricula and teaching; and
- Increased number of Mathematics and Science educators trained through in-service programmes.

The aim of the baseline testing is to provide information on the performance of Grades 3 and 6 learners in Literacy, Numeracy/Mathematics and Science in a sample of IEP schools. The primary reason for carrying out the baseline testing (and subsequent annual testing) is that it serves as a measurement in terms of which project progress might be gauged; further, while the findings are of value to the national Department of Education (DoE) and provincial Departments of Education, they will also help the latter, and the NGO training organisations involved, to respond to the needs identified. JET Education Services (JET) has been appointed to use its tests in carrying out this responsibility. These instruments were developed in collaboration with the national DoE, and extensively piloted in a range of schools that reflected the full spectrum of socio-economic and language conditions that prevail.

The baseline was scheduled to take place in September/October 2004. However, due to the call by the then newly appointed Minister of Education, Naledi Pandor, to align all privately administered learner tests with the national DoE Systemic Evaluation tests, learner testing could not be conducted as originally envisaged by USAID. The baseline learner assessment had, rather, to be postponed to February/March 2005. The tests used in the District Development Support Programme (DDSP) project were revised by JET, in consultation with the Systemic Evaluation Directorate of the national DoE, between September 2004 and February 2005.

## 1.2 Research Questions

Baseline testing was directed to the following questions:

- 1.2.1 At what level are learners performing, overall, in sample IEP and control schools in Numeracy (Grade 3), Literacy (Grade 3), Mathematics (Grade 6) and Science (Grade 6)?
- 1.2.2 Are there differences between IEP and control schools in mean scores for the four LAs? If any, are the differences significant? These questions are aimed at establishing the comparability of the IEP and control schools and providing a benchmark against which IEP performance can be measured over the lifespan of the project.
- 1.2.3 How are learners in project schools (across the different cohorts) performing in relation to key LOs and AS of the national curriculum?
- 1.2.4 Are there differences between the three IEP cohorts (i.e. Better Performing schools, Poor Performing schools and the first group of First Time New Primaries)? Is there a statistically significant difference in learner performance among the different school cohorts?
- 1.2.5 How are female learners performing relative to male learners? Are the differences, if any, statistically significant?
- 1.2.6 What areas can be identified as gaps in learner knowledge? Which gaps, based on the results of the baseline, should be addressed through more intensive and directed training of educators to increase the effectiveness of their teaching?

## 1.3 Research Design

### 1.3.1 Instrumentation

The design of the JET tests is informed by the core competences or LOs for the target grades as contained in the RNCS.

Prior to their use for the IEP baseline testing in February/March 2005, the tests were piloted in a range of schools, in consultation with a Reference Group composed of curriculum experts, and representatives from the national DoE. The Grade 3 Literacy and Numeracy instruments were then translated into the 11 official languages in South Africa. The Grade 6 Mathematics and Science instruments were in English, since English is used as a medium of teaching and learning at this level.

The overall reliability of both the Grades 3 and 6 tests was established by means of a detailed item analysis. Items having an alpha coefficient of less than 0.90 were further analysed and discarded if necessary, thus ensuring that the tests as a whole exhibit a high level of reliability.

The Numeracy/Mathematics tests are diagnostic in two senses: according to specific skills (e.g. addition of whole numbers, ordering of decimals); and according to levels of difficulty (i.e. whether learners are performing at levels expected of Grades 2, 3, 4, 5, 6 or 7 learners).

The Literacy tests assess learners' proficiency in three key outcomes – reading and viewing, thinking and reasoning, and writing – through learners' ability to engage with

three kinds of text: narrative prose, expository prose, and non-narrative texts such as a timetable or a map.

The Science test assessed learners' competence in three areas of Science knowledge: scientific investigations, constructing scientific knowledge, and Science, society and the environment.

Assessment frameworks that guided the development of the four tests are attached as Appendices B, C, D and E for Grade 3 Numeracy, Grade 6 Mathematics, Grade 3 Literacy and Grade 6 Science respectively.

### 1.3.2 Sample

It was decided that the baseline study would test 10% of the 637 schools involved in the IEP. It was recommended to Research Triangle Institute (RTI) International, by JET, that the testing of control schools would be necessary if any conclusive comparisons and deductions were to be made concerning the impact of the project on target schools. In keeping with the 10% to be tested, the sample was subdivided as follows: 8.7% project schools and 1.3% control schools.

Project schools to be tested were drawn by means of a stratified random sample from the total of 637 programme schools. The stratification was based on the IEP categories of schools, namely Poor Performing, Better Performing, and the first group of First Time New Primary schools.<sup>1</sup> The spread across provinces is shown in the table below. In addition, the sample was made up of 1.3% of control schools, drawn from non-IEP schools within IEP districts.

The table below provides a detailed breakdown of the sample.

**Table 1:** Total number of schools tested in the baseline assessment

School cohorts per province in 2005	Total number of IEP schools (January 2005)	Total number of sample IEP schools for the baseline assessment (8.69%)	Total number of control schools for the baseline (1.31%)
<b>Eastern Cape</b>	<b>160</b>	<b>14</b>	<b>2</b>
Better Performing DDSP Schools	15	1	/
Poor Performing DDSP Schools	82	7	/
First group of First Time New Primary Schools	63	6	/
<b>KwaZulu Natal</b>	<b>152</b>	<b>13</b>	<b>2</b>
Better Performing DDSP Schools	25	2	/
Poor Performing DDSP Schools	105	9	/
First group of First Time New Primary Schools	22	2	/

<sup>1</sup> That is, those schools that were not previously part of the DDSP but were recently invited to participate in the IEP project.

<b>Limpopo</b>	<b>281</b>	<b>24</b>	<b>4</b>
Better Performing DDSP Schools	0	0	/
Poor Performing DDSP Schools	255	22	/
First group of First Time New Primary Schools	25	2	/
<b>Northern Cape</b>	<b>44</b>	<b>5</b>	<b>1</b>
Better Performing DDSP Schools	2	(2) <sup>2</sup>	
Poor Performing DDSP Schools	13	1	
First group of First Time New Primary Schools	29	3	
<b>Total</b>	<b>637</b>	<b>57</b>	<b>9<sup>3</sup></b>

A sample of 25 learners was drawn from each of the target grades in each of the sampled schools. In cases where the total grade population for the school was fewer than 25 learners, all learners in the grade were tested at the school. Similarly, where there were just over 25 learners in the grade (i.e. 26 to 30), all the learners in the grade were tested. The total number of learners tested is tabulated below.

**Table 2:** Total number of learners tested in the baseline assessment per instrument

Learning Area	Total number of project school learners	Total number of control school learners	Total number of learners
Grade 3 Numeracy	1279	254	1483
Grade 3 Literacy	1289	254	1493
Grade 6 Mathematics	1283	225	1508
Grade 6 Science	1288	224	1512

The purpose of the tests is to ascertain the level of performance of Grades 3 and 6 learners. Because of the delay (described above) in the testing programme, it was decided to test Grades 4 and 7 learners, on the assumption that, at the start of the new school year, the knowledge of these learners is equivalent to that of Grades 3 and 6 learners, respectively, at the end of the previous school year. Subsequent testing will obviously compare the baseline results with those of Grades 3 and 6 learners at the end of the year.

Two sessions, per grade tested, were required per school. Learners were given 90 minutes to complete each of the tests, although an additional 15 minutes was allowed where it was evident the most of the learners (90%) in the class were not nearing completion within the allotted 90 minute time slot. As it turned out, most (if

<sup>2</sup> In the population list given to JET for Northern Cape, both of the two Better Performing schools did not have required grade levels in the same school. Whereas one school only went up to Grade 4, the other school did not have Foundation Phase classes. For this reason, both schools were included in the sample to test each grade at its respective school.

<sup>3</sup> This was calculated by multiplying 1.3% for each province. Thus 1.31% of 160 in Eastern Cape equalled 2.09, 1.31% of 152 in KZN equalled 1.99, 1.31% of 281 in Limpopo equalled 3.68 and 1.31% of 44 in Northern Cape equalled 0.57. However, the figures were rounded off to the nearest whole number, such that nine control schools were selected for the sample (i.e. two in EC, two in KZN, four in Limpopo and one in NC).

not all) of the learners struggled to finish either of the tests within 90 minutes, and learners wrote for 1 hour and 45 minutes per session.

The process for test administration is explained in more detail in the test administration manual, which is appended to this report in Appendix F. In short, Numeracy and Mathematics were administered first to learners in Grades 4 and 7 respectively. They were given a 30 minute break, after which the same learners were required to sit for the next testing session (i.e. Literacy and Science in Grades 4 and 7 respectively).

The JET tests are not speed tests, but fieldworkers were instructed not to prolong the session beyond 1 hour and 45 minutes, mainly because of the possible influence of learner fatigue. It must be pointed out that for learners successfully performing at the Grade 3 or 6 level as specified by the curriculum, each test would be completed within an hour.

The fact that so many of the learners were not capable of completing a test within the allotted time points to a serious problem within South African schooling. It suggests that learners are not performing to the standards expected by the RNCS.

Language was an important factor considered in this study. In South Africa, for the Foundation Phase classes, the policy is to teach in the learners' home language (i.e. in Afrikaans, IsiZulu, IsiXhosa, Sepedi, Tshivenda or Xitsonga) but from Grade 4 most schools in which English is not the home language start teaching in English. Thus, for the baseline, prior to going into the field, each school's Language of Learning and Teaching (LOLT) for the Foundation Phase was checked with the individual schools and cross-referenced with the RTI database. This information guided JET on which language to use for administering the tests to respective schools in Grade 4, while all Grade 7 learners were tested in English. The only exception was in Northern Cape, where 99% of schools selected for the sample had Afrikaans as their LOLT for both Grades 3 and 6. In a few schools, it was discovered that schools were dual medium of instruction. In this situation, the language with the greatest number of learners was the language in which tests were administered. Every effort was made to ensure that the tests were administered in the appropriate LOLT for each school.

### **1.3.3 Fieldworkers**

Tests administrators were recruited using the following criteria:

- Fluency in the language of the learners in the schools or the language of instruction of the school (e.g. isiXhosa, Sepedi, Xitsonga, Tshivenda, IsiZulu, English or Afrikaans);
- Experience in teaching or educational research;
- Relative proximity to the sampled schools; and
- Recommendations of reliability for similar educational fieldwork done previously.

Fieldworkers were sourced through existing JET networks. Attributes such as possessing a good verbal-linguistic intelligence, having empathy with the target group, and having good people skills to interact with teachers and learners alike, were also taken into account.

The fieldwork was overseen by four Provincial Co-ordinators, who trained fieldworkers in their provinces, managed logistical arrangements and quality assured

data collection. Training involved presentations and practical applications. A manual was prepared to act as a guideline for both the training and fieldwork processes.

Prior to learner testing, each Provincial Co-ordinator conducted an advocacy session with provincial and district officials as target audience. These sessions were intended to solicit buy-in and support from provincial Department of Education officials. The testing project derived a number of benefits from these advocacy sessions, *inter alia*:

- District Officials (DOs) participated in the monitoring and quality assurance process;
- Provincial Departments of Education provided letters for fieldworkers to take to sampled schools as a way of showing that the testing activity was sanctioned by the Department; and
- Schools co-operated fully with fieldworkers.

Fieldwork was conducted between 25 February and 11 March 2005.

### **1.3.4 Quality assurance and monitoring of fieldwork**

JET allocated a Provincial Co-ordinator to each of the four provinces participating in the IEP to take full responsibility for the smooth implementation of the testing schedule in the particular province. Each Provincial Co-ordinator visited at least four of the sampled schools for monitoring and quality assurance purposes. No significant deviations from the manual were observed. The overall impression was that the fieldworkers were efficient and punctual, and that where discretion was allowed it was exercised responsibly.

DOs were invited to attend all sessions of learner testing to help monitor and observe. All officials extended their support, but only in Northern Cape did the DO actually attend the testing sessions.

### **1.3.5 Scoring, data capture and analysis**

#### **1.3.5.1 Scoring**

Eight scorers were contracted to score the tests over a period of two weeks using scoring guides or memoranda. The selection criteria were:

- Knowledge of the different languages of instruction used in the sampled schools; and
- Recommendations on reliability and experience in scoring.

Each question was scored using the following criteria:

- If the learner answered the question correctly, a code of one (1) was allocated;
- If the learner answered the question incorrectly, a code of zero (0) was allocated.

#### **1.3.5.2 Data capture and analysis**

Codes for each question were captured on an Excel spreadsheet and later exported to a statistical programme – Statistical Package for the Social Sciences (SPSS), for analysis.

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# CHAPTER TWO:

## RESULTS OF LEARNER PERFORMANCE

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## **2. INTRODUCTION**

The remainder of this report provides a discussion of the learner performance results of the Grade 3 Numeracy test, Grade 3 Literacy test, Grade 6 Mathematics test and Grade 6 Science test, which were administered to Grades 4 and 7 learners in a sample of 66 schools (57 project schools and 9 control schools) in the baseline study in March 2005.

The results are presented per instrument according to the following categories:

1. Comparison between project and control schools on:
  - performance on overall test; and
  - level of difficulty (where respective test frameworks allowed for this).
2. Performance of project schools only across:
  - IEP cohort classification (Better Performing, BP; Poor Performing, PP; and First Time New Primaries, FT);
  - provinces (Eastern Cape, EC; KwaZulu Natal, KZN; Limpopo, Limp; and Northern Cape, NC);
  - districts in each of the four respective provinces;
  - gender (male or female); and
  - knowledge/skill domains or LOs.

The IEP schools are not representative of the four provinces in which they are situated. Therefore, differences in performance between IEP schools drawn from different provinces are not indicative of the relative performances of the provinces as a whole. Similarly, differences in performances across the districts do not necessarily imply anything about the quality of education provided in those districts, as many factors – principally the socio-economic context of the learners – influence performance. Finally, differences in performance of project and control schools cannot be attributed to the influence of the project at this stage, as the current report is merely a baseline for purposes of future comparison.

The findings will be presented mainly as graphs; however, related tables can be found in Appendix G.

### **2.1 Grade 4 Performance**

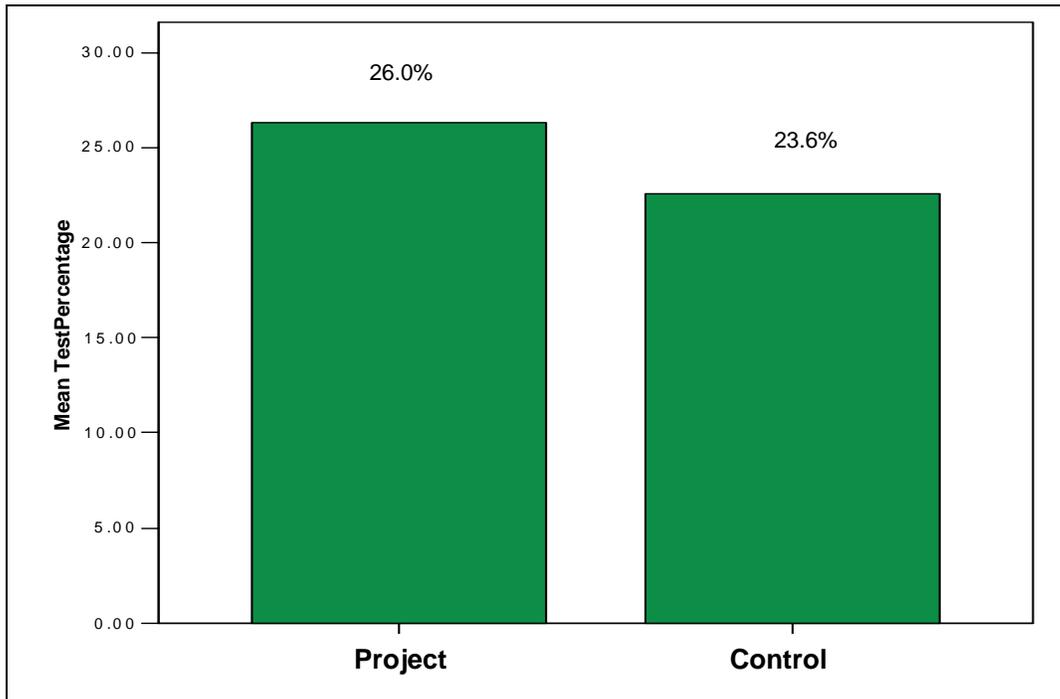
#### **2.1.1 Numeracy**

##### **2.1.1.1 Comparison of project and control schools**

###### **2.1.1.1.1 Performance on overall test**

Graph 1 below shows the mean score for the Grade 4 learners in project schools and the Grade 4 learners in control schools.

**Graph 1:** Performance of Grade 4 learners on the Numeracy test: comparison of overall mean percentages between project schools and control schools<sup>4</sup>



As explained earlier in this report, in order to determine whether the IEP programme is indeed having an impact, it is necessary to compare performances in schools that are influenced by the IEP programme to performances in schools that do not have the IEP project functioning in the schools. As can be seen from the above graph, project schools are performing at a marginal 2.5% better than control schools on the Grade 3 Numeracy test.<sup>5</sup>

Despite this marginal difference between groups, it should be noted that the overall mean was below 30% in both groups. This indicates that both project schools and control schools are performing far below the expectations of the curriculum.

#### **2.1.1.1.2 Level of difficulty**

As discussed in section 1.3.1 above, the tests are diagnostic in two ways – by skill and by grade level of difficulty. Thus, each item is classified according to the skill it assesses and whether it does this at a Grade 1, Grade 2, Grade 3 or Grade 4 level of difficulty. This section looks at the performance of learners on the latter dimension. We used a score of 50% as a benchmark and calculated the proportion of learners who achieve this benchmark at each of the levels of difficulty.

The percentage of Grade 4 learners in project schools achieving means of 50% or more at each level of difficulty is depicted in table 3 and graph 2 below:

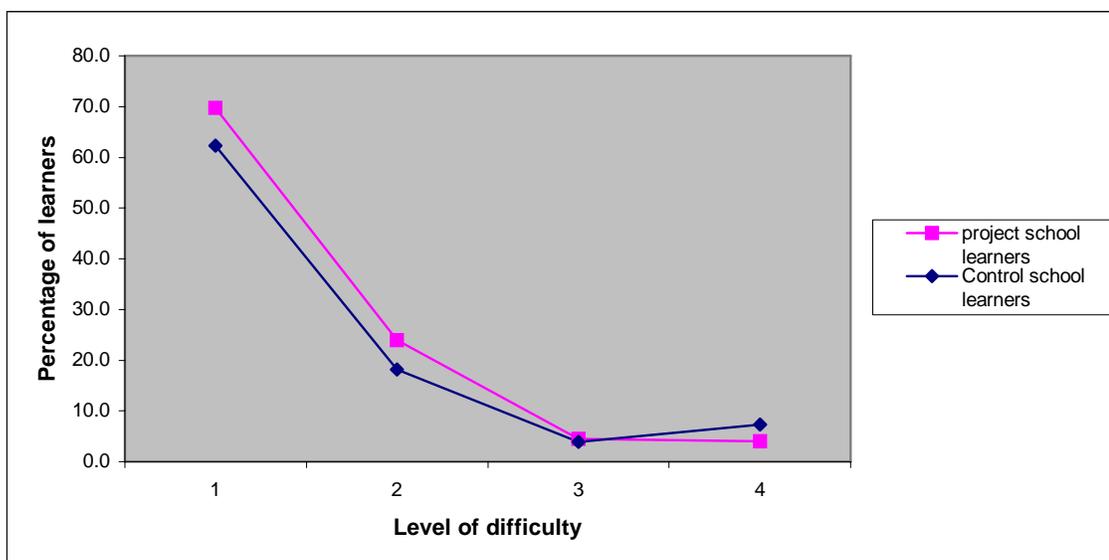
<sup>4</sup> See table (a) in Appendix G.

<sup>5</sup> The difference shown is marginal but to determine whether this difference is significant, an Independent Sample T-test was run. The significance value for the test was 0.04, which is lower than the interval confidence error of 0.05 ( $p < 0.05$ ). This indicates that there is a significant difference between the two groups.

**Table 3:** Number of Grade 4 learners achieving 50% or more (per group) at each level, on the Numeracy test

Level of difficulty	Group	Total no. of learners tested	No. of learners who achieved 50% of more	
			No. of learners	% of total no. of learners
Grade 1	Project	1279	892	69.7
	Control	204	127	62.3
Grade 2	Project	1279	307	24.0
	Control	204	37	18.1
Grade 3	Project	1279	57	4.5
	Control	204	8	3.9
Grade 4	Project	1279	52	4.1
	Control	204	15	7.4

**Graph 2:** Percentage of Grade 4 learners in project schools who achieved 50% or more for each level of difficulty on the Numeracy test



As illustrated in table 3 and graph 2, more learners in both project schools and control schools were able to correctly answer Grade 1 level items than they were able to answer Grades 2, 3 and 4 level items. In fact, 70% of learners in project schools and 62% in control schools were able to answer Grade 1 level items. However, the fact that Grade 4 learners have mastered **Grade 1 level** items should not come as a surprise, as Grade 1 level is when the most basic Numeracy skills are taught and are the easiest items on the Numeracy test.

However, only a quarter (24%) of the learners in project schools, and even fewer in control schools (18%), are passing at a **Grade 2 level**. This also means that the majority of learners (76% in project schools and 82% in control schools) have not progressed beyond the level of Grade 2.

More disconcerting, as shown in Graph 2 above, is the fact that just under 5% of Grade 4 learners in project schools are performing at a **Grade 3 level** – the expected level of performance for this sample. For control schools, the percentage is even lower, where only 4% of the Grade 4 learners are passing at expected levels. This means that a large percentage (95% in project schools and 96% in control schools)

of learners who passed Grade 3 at the end of 2004 are not sufficiently competent at the Grade 3 level.

This is very worrying as it suggests that not only will learners struggle with new concepts, but teachers' planning and pace will be thrown off completely as they try to provide the necessary foundation. However, because the test administration took place in March 2005, it is unlikely that Grade 4 learners, in both project and control schools, would have been able to master adequately the skills required at a Grade 4 level of difficulty. The fact that 4% of Grade 4 learners managed to answer **Grade 4 items** correctly is a commendable achievement in the light of the findings from the other difficulty levels.

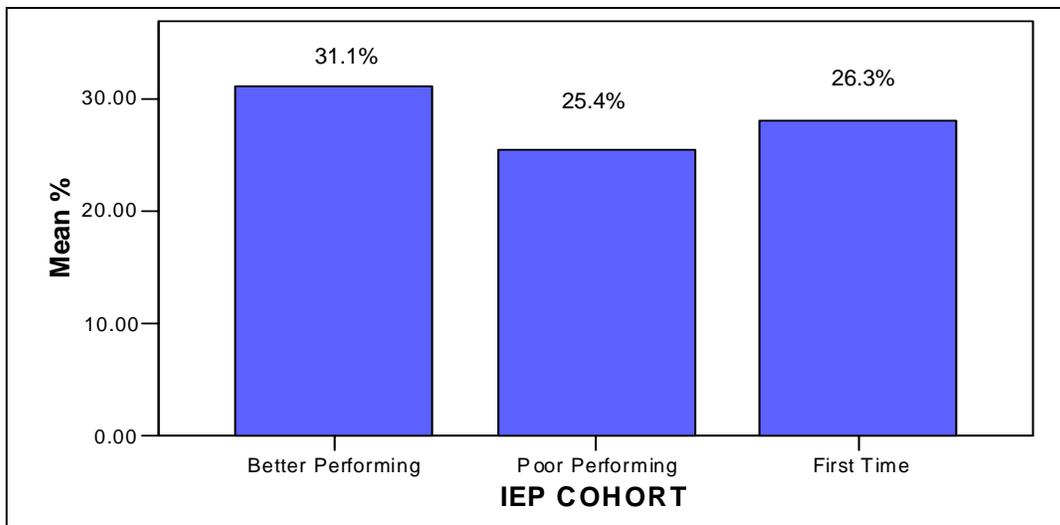
It is interesting that, while 95% of learners failed to perform well at a Grade 3 level, 4% were able to answer some Grade 4 level questions correctly. This finding may be attributed to a number of factors, but the most probable explanation would be that the sample included a few gifted learners who were able to deal with items at all difficulty levels (up to and including Grade 4 level items).

### 2.1.1.2. Performance of project schools

#### 2.1.1.2.1 IEP cohort classification

In 2000 the DDSP project classified all its schools across all four provinces (the same schools involved in the IEP) according to cohorts. These cohorts were based on overall performances of schools on a different test administered in 2000, 2002 and 2003. The schools performing with a less than 40% mean score were classified as **Poor Performing**, while those performing with more than 40% were classified as **Better Performing**. Schools that were not previously part of the DDSP but that were recently invited to be part of the IEP project were termed the **first group of First Time Primary Schools** (referred to by the researchers as **First Time New Primaries**). Graph 3 below presents the overall mean percentage for Grade 4 learners, as disaggregated by the IEP cohort classification.

**Graph 3:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Numeracy test<sup>6</sup>



<sup>6</sup> Refer to table (b) in Appendix G.

As can be seen from graph 3 above, the 'Better Performing schools' are indeed performing 6% better than the 'Poor Performing schools'. The 'First Time New Primaries' are performing better than the Poor Performing schools but not as well as the Better Performing schools. Generally, the mean score was below 35% across all cohorts, and the Poor Performing schools are still performing the worst in comparison to the other two cohorts.

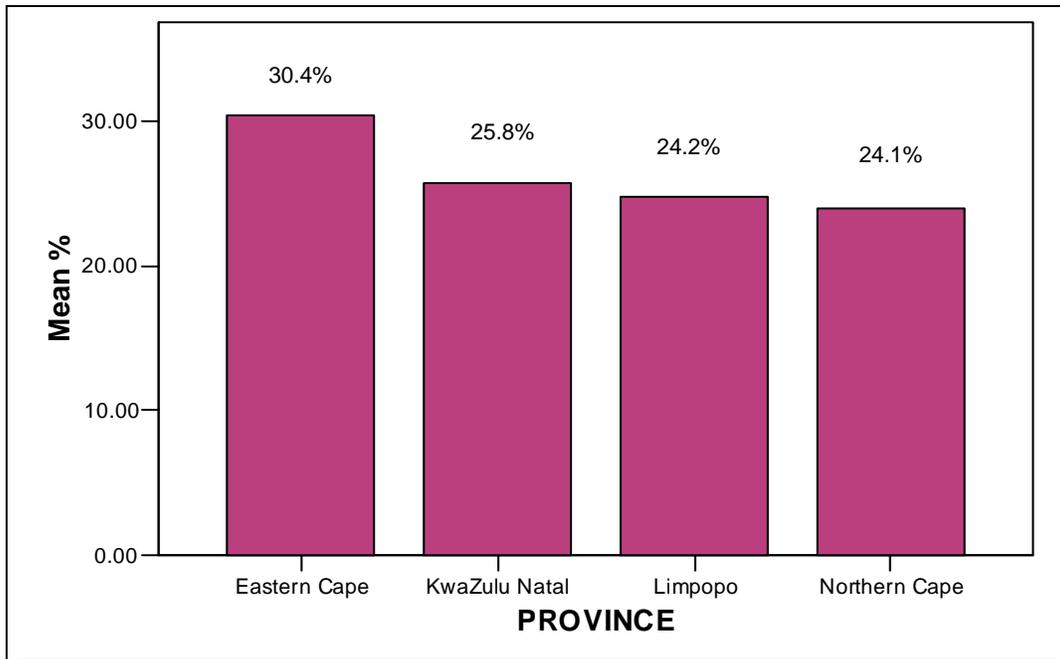
An ANOVA test of significance was run to determine whether the differences in performance levels in each cohort were significant. The test revealed that at a 95% confidence level, there was no difference in performance levels between the Better Performing and the First Time New Primary cohorts and between the Poor Performing and the First Time New Primary cohorts. However, the 6% difference between the Better Performing and the Poor Performing cohorts was statistically significant at a 0.05 level.

### 2.1.1.2.2 Provinces

When the data are disaggregated by provinces, Eastern Cape performed slightly better than the other three provinces, followed by KwaZulu Natal, and then Limpopo and Northern Cape.

Graph 4 below shows that the overall mean percentage for KwaZulu Natal, Limpopo and Northern Cape performed at similar<sup>7</sup> levels, while Eastern Cape performed the best.

**Graph 4:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by province) on the Numeracy test<sup>8</sup>



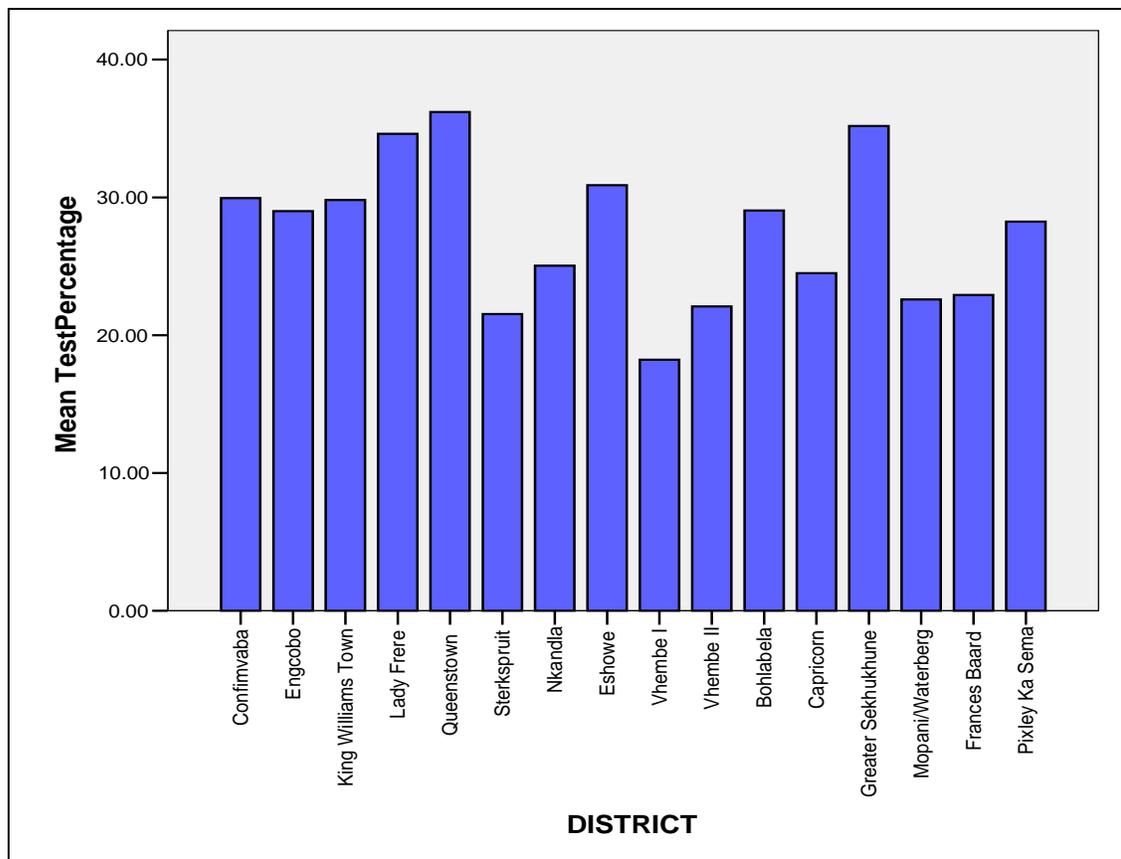
<sup>7</sup> This is supported by the ANOVA test, which shows that there is no significant difference between KZN, Limpopo and Northern Cape. The only significant difference is between Eastern Cape and the other provinces.

<sup>8</sup> Refer to table (c) in Appendix G.

### 2.1.1.2.3 Districts

The mean percentage for each district is shown in graph 5 below.

**Graph 5:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by district) on the Numeracy test<sup>9</sup>



The graph shows that there are only three districts that are performing with an overall mean score of 35% or more:

- Queenstown, in Eastern Cape, with a mean score of 36%;
- Lady Frere, also in Eastern Cape, with a mean score of 35%; and
- Greater Sekhukhune, in Limpopo, with a mean score of 35%.

The majority of districts recorded a mean score of between 24% and 30%.

The districts with the lowest mean scores (i.e. lower than 24%) were:

- Vhembe I (the poorest performing district), in Limpopo, with a mean score of 18%;
- Sterkspruit, in the far Northern region of Eastern Cape, with a mean score of 21.5%;
- Vhembe II, in Limpopo, with a mean score of 22%; and
- Frances Baard, in Northern Cape, with a mean score of 23%.

<sup>9</sup> Refer to table (c) in Appendix G.

#### 2.1.1.2.4 Gender

An important component of this project was to determine whether gender has an influence on overall performance. This is represented in table 4 below.

**Table 4:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by gender) on the Numeracy test

Gender	Mean %	N	Std. deviation
Female	26.4	655	16.12003
Male	25.4	601	16.11989
Total *	25.9	1256	16.12121

\* The total does not equal 1279 as 23 learners did not reveal their gender and are therefore considered missing cases.

As shown in the table above, female Grade 4 learners seem to be performing slightly better than males on the Grade 3 Numeracy test. However, a test of significance shows that the mean difference of 1% is not statistically significant.<sup>10</sup>

#### 2.1.1.2.5 Knowledge/skill domains

The knowledge/skill domains assessed by the Grade 3 Numeracy instruments are (i) counting, ordering, number representation; (ii) addition; (iii) subtraction; (iv) multiplication; and (v) division. The results are given by group, IEP school cohort, and province.

##### **a) Comparison project and control schools**

Table 5 below compares the mean percentage for the Grade 4 learners in project schools and control schools on each of the five knowledge/skill domains.

**Table 5:** Comparison of Grade 4 learners in project schools and control schools: mean percentage per each of the five Numeracy skills

Group	Statistics	Counting	Addition	Subtraction	Multiplication	Division
Project	Mean %	28.9	32.0	25.6	24.7	11.5
	N	1279	1279	1279	1279	1279
	Std. deviation	17.814	20.959	20.061	19.708	13.338
Control	Mean %	22.9	28.7	25.4	23.7	11.2
	N	204	204	204	204	204
	Std. deviation	16.134	20.960	21.250	18.432	13.264

The above data provide useful information on the learners' relative strengths and weaknesses in Numeracy skills.

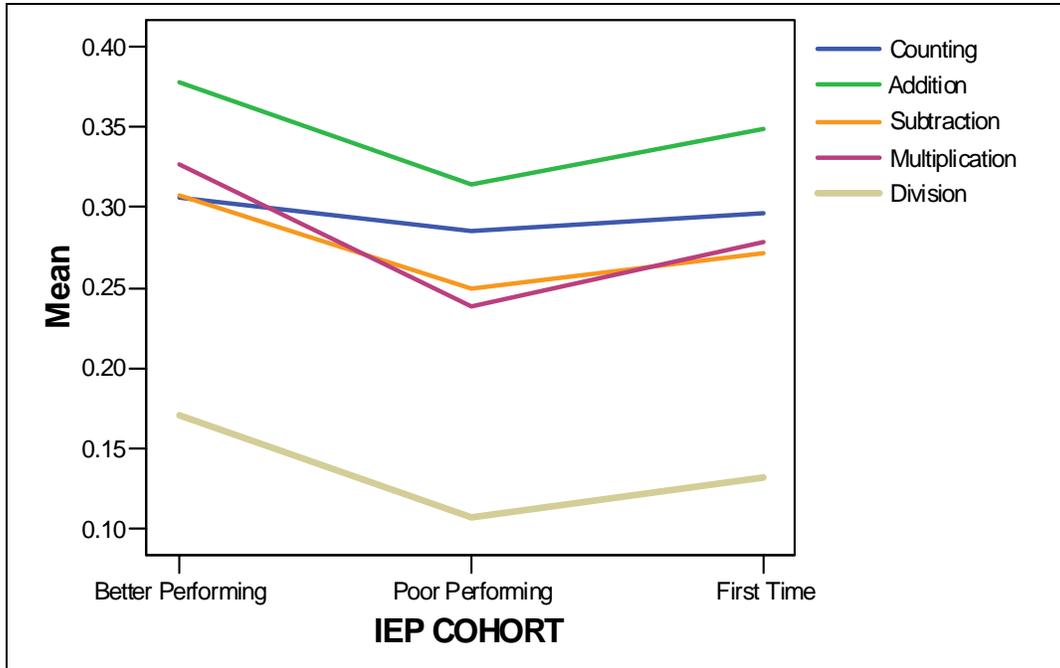
As shown in table 5 above, Grade 4 learners in both the project schools and the control schools are performing best on basic operations, particularly in addition, followed by counting, ordering and representing numbers and then subtraction and multiplication. Learners have the greatest difficulty in correctly answering items that deal with division skills.

<sup>10</sup> The significance value for the Independent Sample T-test was 0.275, which is greater than 0.05. This indicates that there is no significant difference between the two group means. Thus, female and male Grade 4 learners are performing at similar levels.

**b) Comparison by IEP cohort classification**

When the data for project schools are disaggregated by IEP cohort classification, the pattern shown in graph 6 emerges:

**Graph 6:** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Numeracy test<sup>11</sup>



Similar to the findings of table 5, addition is the greatest strength with a mean score of greater than 30% across all cohorts, while division is the greatest weakness with a mean score of less than 17% across all cohorts.

Better Performing schools performed the best overall across all knowledge/skill domains. However, compared to the other two cohorts, the Better Performing schools performed better on multiplication and subtraction skills than they did on counting, ordering and number representation. Although the mean score for Better Performing schools was higher than the other two cohorts, the fact that learners in the Better Performing schools are struggling with counting, ordering and representing numbers signifies that these learners still do not completely understand the number system. Further, the majority of learners who correctly answered multiplication questions calculated the multiplication problems using continuous addition. It is difficult to know whether poor performance on word problems is due to learners not understanding the concept or to learners not being able to read the word problems. The observations done by fieldworkers during testing suggest that the latter is more likely the case.

In terms of Poor Performing schools, addition was followed by counting, then subtraction, multiplication and division. This is generally the pattern shown in most schools across South Africa. This suggests that these learners seem to have some basic understanding of basic operations but struggle with the more complex tasks such as multiplication and division.

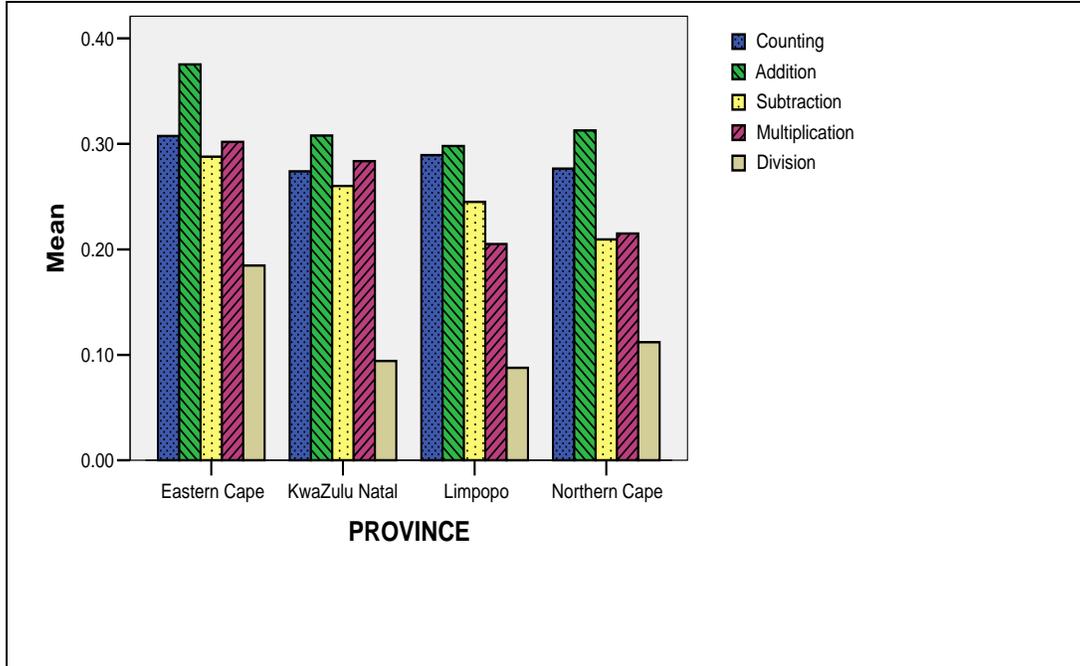
First Time New Primaries showed a similar pattern.

<sup>11</sup> Refer to table (d) in Appendix G.

**c) Comparison by province**

The provincial breakdown of performance of Grade 4 learners in project schools across the five knowledge/skill domains is illustrated below.

**Graph 7:** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by province) on the Numeracy test<sup>12</sup>



Similar strengths and weakness are evident: addition is the greatest strength across all four provinces and division is the weakest. Eastern Cape continues to be the best performing province across all five skill sets while the performance in KwaZulu Natal, Limpopo and Northern Cape follows relatively similar patterns. Limpopo learners are better able to perform counting, ordering and number representations than their counterparts in Northern Cape and KZN. However, learners in KZN performed substantially better than Limpopo and Northern Cape on multiplication items. Northern Cape learners performed the worst in correctly answering subtraction items but better than NC and KZN on division items.

These strengths in different skills may be a result of different teaching styles across the provinces. However, it is important that teachers in these schools in respective provinces be aware that their Grade 4 learners are generally underperforming – they are not performing at expected levels of difficulty and most learners (more than 60%) still cannot competently answer items requiring counting, representing and ordering of numbers.

It is important to remember that a sound conceptual understanding of the four operations (addition, subtraction, multiplication and division) is built on a good grasp of the number system, as reflected in counting and ordering tasks. The fact that the performance in the latter skills is weaker than the performance in addition across all three cohorts and across all four provinces indicates that understanding of addition is likely to have shallow roots, and that if a solid understanding of the four operations is to be built, it should be based on extensive work on understanding the number

<sup>12</sup> Refer to table (e) in Appendix G.

system. This is significant for the IEP intervention as it suggests that, in general, learners have insufficient understanding of the number system or number concepts. This is supported by the fact that the majority of learners used their fingers or stick figures when they approached addition, subtraction and multiplication problems. At Grades 3 and 4 levels, learners should have progressed beyond these 'baby' methods, whereby operations are reduced to laborious counting procedures: for example, drawing 7 marks and an additional 5 marks, to find the solution to  $7 + 5$ .

These concrete methods are acceptable in the early stages of Numeracy but become an impediment when dealing with larger numbers. This is well illustrated by the fact that learner performance falls off rapidly when tens, hundreds and thousands are encountered and when multiplication items are calculated using continuous addition. It is clear that many learners are not making the transition to more abstract methods, which depend upon a good understanding of the structure of the base-10 number system.

## **2.1.2 Literacy**

### **2.1.2.1 Comparison of project and control schools**

#### **2.1.2.1.1 Performance on overall test**

The Grade 3 Literacy test<sup>13</sup> consists of 36 items, of which 28% were multiple-choice questions, 58% were short answers, and 14% were extended responses. These items are grouped into seven questions, which deal with three LOs: (i) reading and viewing, (ii) thinking and reasoning and (iii) writing. These outcomes were assessed through learners' ability to engage with three kinds of text:

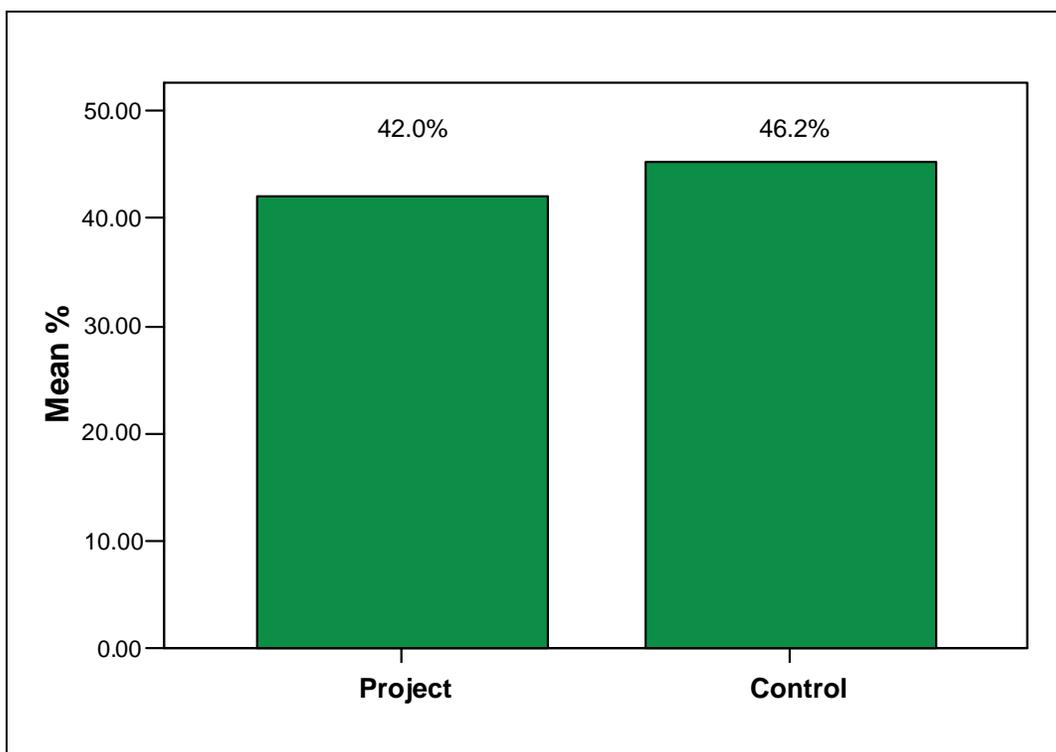
- Narrative prose;
- Expository prose; and
- Informational documents.

The overall mean percentage for the Grade 4 learners tested in the baseline in both project schools and control schools is presented graphically below.

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<sup>13</sup> Assessment frameworks for the Literacy tests were constructed before the instruments were developed. These assessment frameworks were constructed by using the guidelines as set out by the RNCS Assessment Standards document, with specific reference to the Grades 3 and 6 Reading and Writing curriculum, English Second Language. For each grade, the relevant LOs were identified, along with the AS and types of activities that the learner should be able to do in relation to the LO.

**Graph 8:** Performance of Grade 4 learners on the Literacy test: comparison of overall mean between project schools and control schools<sup>14</sup>



Graph 8 shows that, for Literacy, control schools are performing 2% better than project schools.<sup>15</sup>

Although the literacy levels achieved by Grade 4 learners in both project and control schools are higher than the overall mean percentage achieved by the same learners in the Numeracy test, overall means on the Literacy test are still below expected levels.

#### 2.1.2.1.2 Level of difficulty

Unlike the Numeracy test, the assessment framework for the Literacy test did not distinguish level of difficulty by grades.<sup>16</sup>

Table 6 shows the number of Grade 4 learners in project schools and control schools achieving means of 50% or more on the overall Literacy test.

<sup>14</sup> Refer to table (f) in Appendix G.

<sup>15</sup> The difference shown is marginal but to determine whether this difference is significant, an Independent Sample T-test was run. The significance value for the test was 0.08, which is higher than the interval confidence error of 0.05 ( $p > 0.05$ ). This indicates that there is no significant difference between the two groups.

<sup>16</sup> In terms of test construction, the eight levels of reading competences as stipulated by the guidelines suggested and used by the Southern and East African Consortium for the Monitoring of Educational Quality (SACMEQ) Reading Levels were used. These are ordered from those reading activities or abilities regarded as most basic and simple at level 1, through to the more complex and advanced reading skills required by levels 7 and 8. However, these levels were mainly for international benchmarking and are therefore not relevant to this study. Instead, 50% was used as the minimal acceptable average score, and an average score below 50% is regarded as an indicator of poor performance.

**Table 6:** Number of Grade 4 learners achieving 50% or more (as disaggregated by group) on the Literacy test

Group	Total number of learners tested	Total number of learners who achieved 50% or more	% of total no. of learners
Project	1289	486	37.7%
Control	204	98	48.0%

Of the total 1289 learners in project schools who wrote the Literacy test, just over a third (38%) of Grade 4 learners achieved an overall mean score of 50% or more. In control schools, the number of learners who achieved 50% or more was 48%. This suggests that more than half of the learners who wrote the Literacy test are struggling to read at the expected levels of the grade. As reading is a major tool for enabling all other LAs – for example in Numeracy and Science – learners who cannot read have little hope of coping in later grades unless urgent and effective intervention takes place.

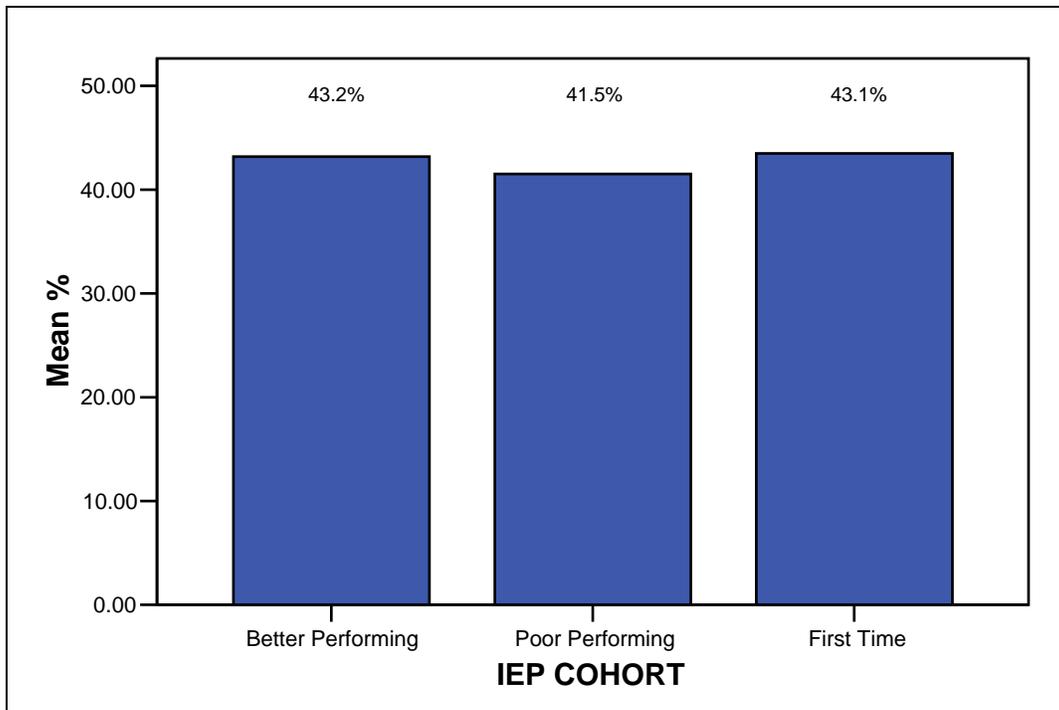
Appendix H provides scanned examples of how learners write sentences.

### 2.1.2.2 Performance of project schools

#### 2.1.2.2.1 IEP cohort classification

Graph 9 below presents the overall mean percentage for Grade 4 learners, as disaggregated by IEP cohort classification.

**Graph 9:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Literacy test<sup>17</sup>



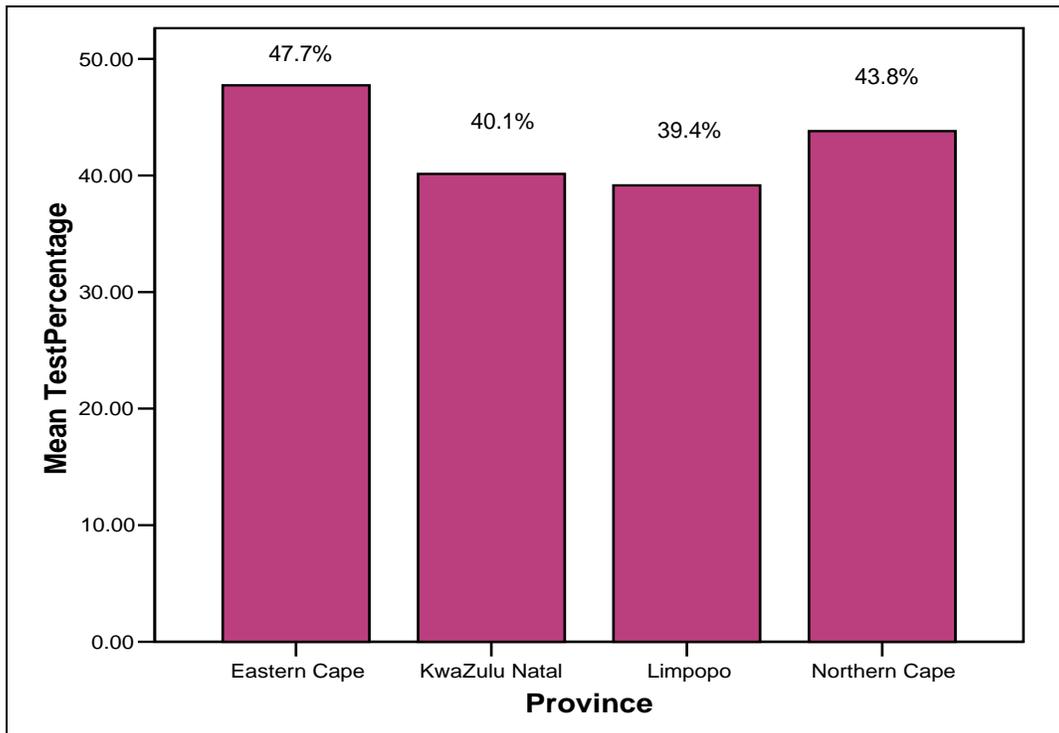
<sup>17</sup> Refer to table (g) in Appendix G.

As shown in the graph above, the three cohorts are performing at more or less the same level, with mean scores ranging between 42% and 44%. An ANOVA test of significance shows that there are no significant differences between the three cohorts ( $p>0.05$ ).

### 2.1.2.2.2 Provinces

In the Grade 3 Literacy test, when the data are disaggregated by province, the Eastern Cape performed slightly better than the other provinces, with a performance rate of 48%. Northern Cape followed with 44%, KZN with 40%, and Limpopo with 39%.

**Graph 10:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by province) on the Literacy test<sup>18</sup>



The results point to the fact that more than half of the Grade 4 learners across all the four provinces – and particularly so in Limpopo and KZN – are struggling to read and write at expected levels as prescribed by the curriculum.

Again, as with the Numeracy test, there are no significant differences in mean percentages between KwaZulu Natal, Limpopo and Northern Cape, but the overall mean percentage of Eastern Cape (with the highest overall mean percentage) differs significantly from KwaZulu Natal and Limpopo (according to the ANOVA test of significance).

<sup>18</sup> Refer to table (h) in Appendix G.

### 2.1.2.2.3 Districts

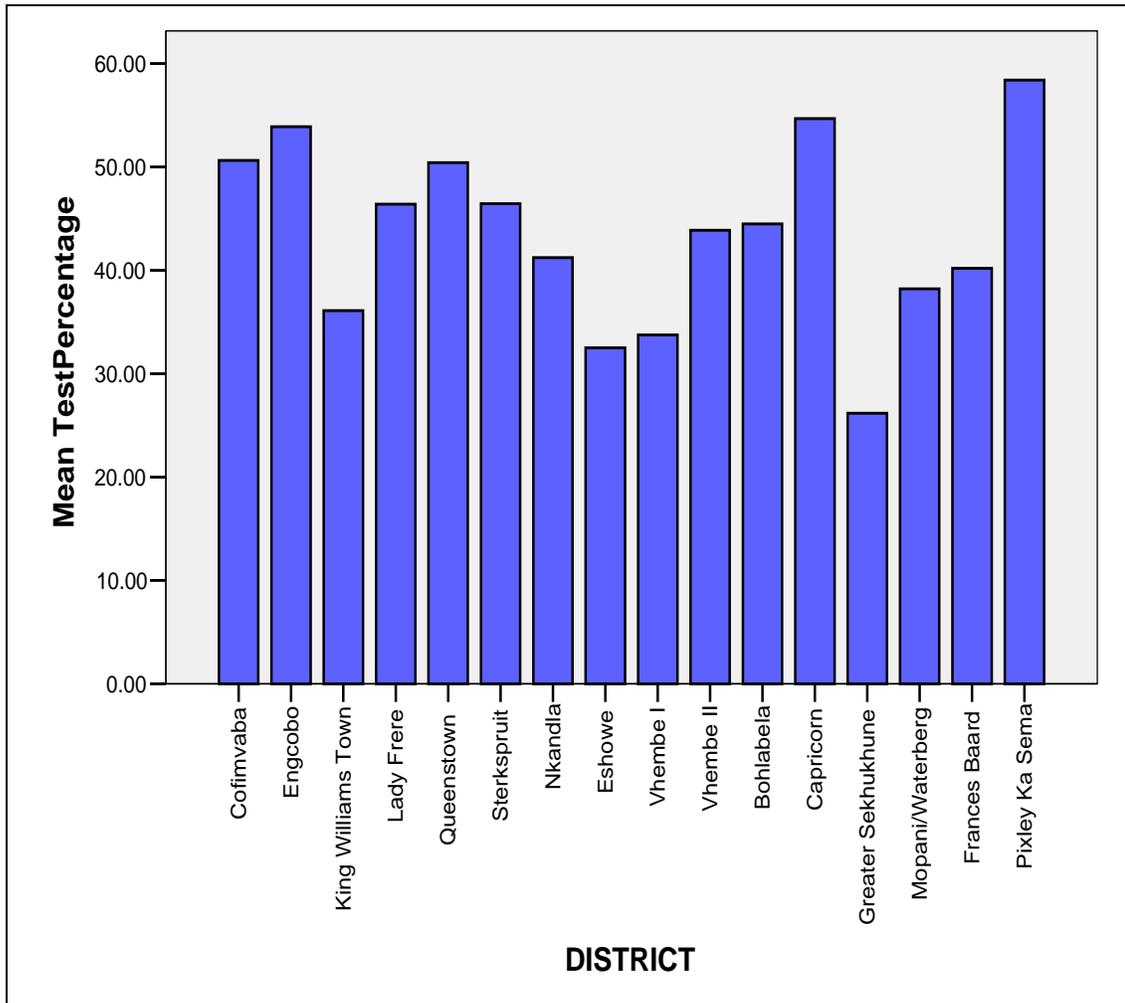
According to graph 11 below, there are five districts that are performing with an overall mean score of 50% or more:

- Pixley Ka Sema, in Northern Cape, with an impressive mean score of 58%;
- Capricorn, in Limpopo, with 55%;
- Engcobo, in Eastern Cape, with 54%;
- Cofimvaba, in Eastern Cape, with 51%; and
- Queenstown, also in Eastern Cape, with 50%.

The poorest performing districts (i.e. they achieved means of lower than 35%) include:

- Vhembe I, in Limpopo, with a mean score of 34%;
- Eshowe, in KZN, with a mean score of just under 33%; and
- Greater Sekhukhune, in Limpopo with 26% (the lowest mean percentage in comparison to other districts).

**Graph 11:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by district) on the Literacy test<sup>19</sup>



<sup>19</sup> Refer to table (i) in Appendix G.

#### 2.1.2.2.4 Gender

As shown by table 10, female learners performed slightly better than males, with average scores around the 43% mark; male learners performed on average around the 42% mark.

**Table 7:** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by gender) on the Literacy test

Gender	Mean %	N	Std. deviation
Female	42.8	672	21.09787
Male	41.6	594	21.04414
Total *	42.3	1266	21.07088

\* The total does not equal 1289 as 23 learners did not reveal their gender and are therefore considered missing cases.

The table above shows that female and male learners achieved almost identical mean percentages. An Independent Sample T-test shows that there is no significant difference between the two group means ( $p > 0.05$ ).<sup>20</sup>

#### 2.1.2.2.5 Knowledge/skill domains

The following core reading and writing competences or LOs are assessed in the Literacy test:

- Word recognition;
- Comprehension; and
- Short passage composition.

In particular, the tests assessed learners' ability to access information, infer information, use language in context, and apply information from a variety of forms such as illustrations, graphs, etc.

All this is assessed through the three RNCS LOs for the Foundation Phase:

- Reading and viewing;
- Thinking and reasoning; and
- Writing

The mean percentages for each of these LOs are discussed along three categories: by group, IEP school cohort and province.

#### **a) Comparison by project and control schools**

Table 8 below shows the mean percentage for the Grade 4 learners in project schools and control schools for each of the five knowledge/skill domains.

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<sup>20</sup> The significance value for the T-test was 0.361, which is greater than 0.05. This indicates that there is no significant difference between the two group means. Thus, female and male Grade 4 learners are performing at similar levels.

**Table 8:** Comparison of Grade 4 learners in project schools and control schools: mean percentage per each of the 3 Literacy skills

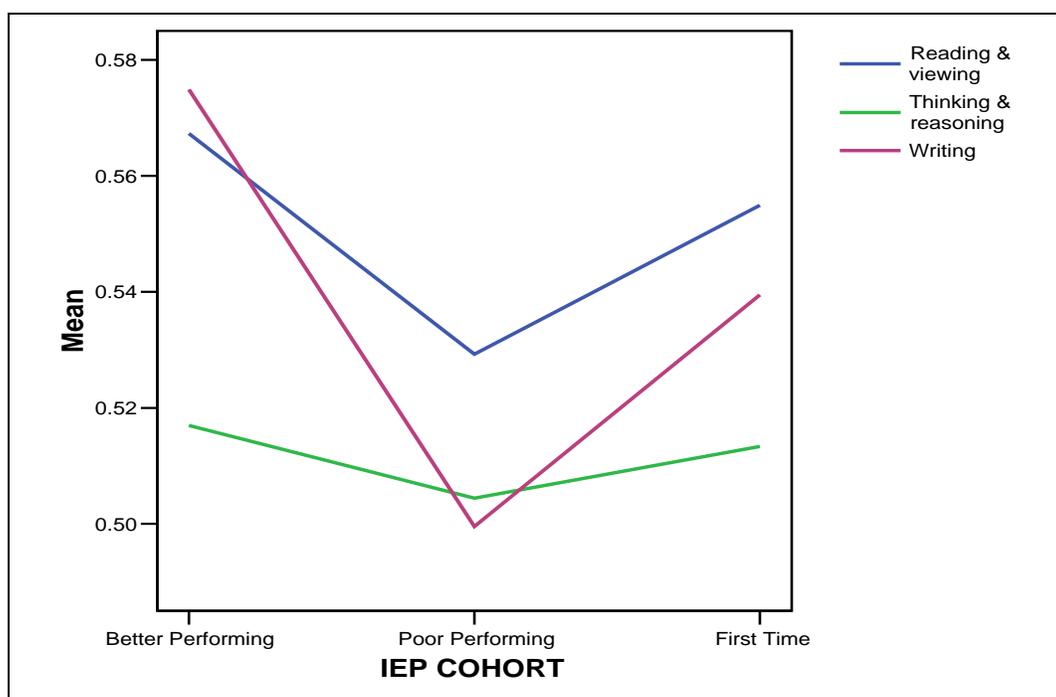
Group	Statistics	Reading & Viewing	Thinking & Reasoning	Writing
Project	Mean %	53.6	50.7	51.5
	N	1289	1289	1289
	Std. deviation	26.361	25.165	38.825
Control	Mean %	58.9	52.2	56.5
	N	204	204	204
	Std. deviation	26.791	23.301	37.202

As shown in table 8 above, Grade 4 learners in both the project schools and the control schools are performing best on skills where reading and viewing are required. Thinking and reasoning, and writing, were the skills that both project school learners and learners in control schools answered least well.

***b) Comparison by IEP cohort classification***

When the data for project schools are disaggregated by IEP cohort classification, the following pattern emerges.

**Graph 12:** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Literacy test<sup>21</sup>



**Reading and viewing** was the strongest skill among both Poor Performing schools and First Time New Primaries. However, the overall mean percentage of reading and viewing – in the case of Better Performing schools – was higher than for both the Poor Performing schools and First Time New Primaries.

<sup>21</sup> Refer to table (j) in Appendix G.

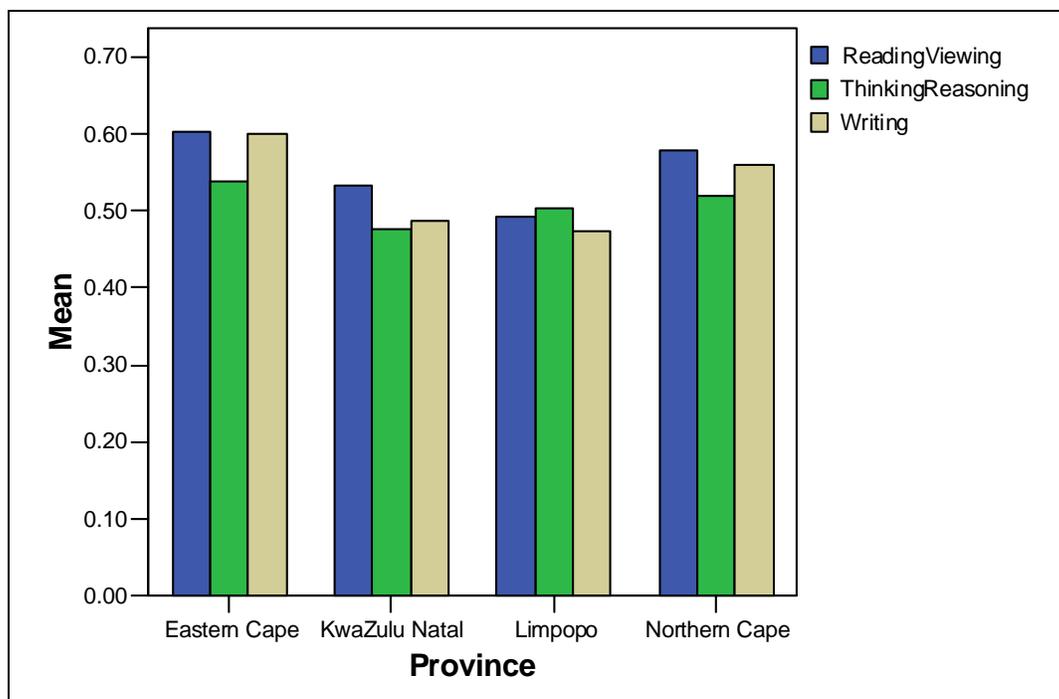
Better Performing schools performed relatively well in **writing**, which involves extended responses, while Poor Performing schools performed the worst on this skill.

**Thinking and reasoning** was shown to be the weakest skill across all cohorts, where a mean of lower than 50% was achieved.

***c) Comparison by province***

The provincial breakdown of performance of Grade 4 learners in project schools across the three Literacy LOs is illustrated below:

**Graph 13:** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by province) on the Literacy test<sup>22</sup>



Similar strengths and weakness are evident: reading and viewing is the greatest strength across all provinces, except in Limpopo where thinking and reasoning was (marginally) the strongest skill; this is unlike the other provinces where this was generally the weakest skill.

Eastern Cape continues to be the best performing province across all three skill areas. The performance in the Northern Cape closely resembles that of the Eastern Cape. KwaZulu Natal and Limpopo appear to be performing less well across the three skill areas as the mean score for each of these skill areas was generally below 50% (except for reading and viewing in KZN).

<sup>22</sup> Refer to table (k) in Appendix G.

## 2.2 Grade 7 Performance

### 2.2.1 Mathematics

The Mathematics tests for Grade 6 consisted of four different tasks. Tasks 1 and 2 consisted of 30 items, all of which required short, single answers. Task 3 consisted of 20 items. As with Tasks 1 and 2, all Task 3 items required short, single answers from learners or were in the form of multiple-choice questions. Task 4 consisted of 20 items. Fifteen of these items were in the form of multiple-choice questions, while the remaining five items required short, single answers. The pilot of this test done in February 2005 found that all four Mathematics tasks have high levels of reliability and were developed at appropriate levels of difficulty for Grade 6.

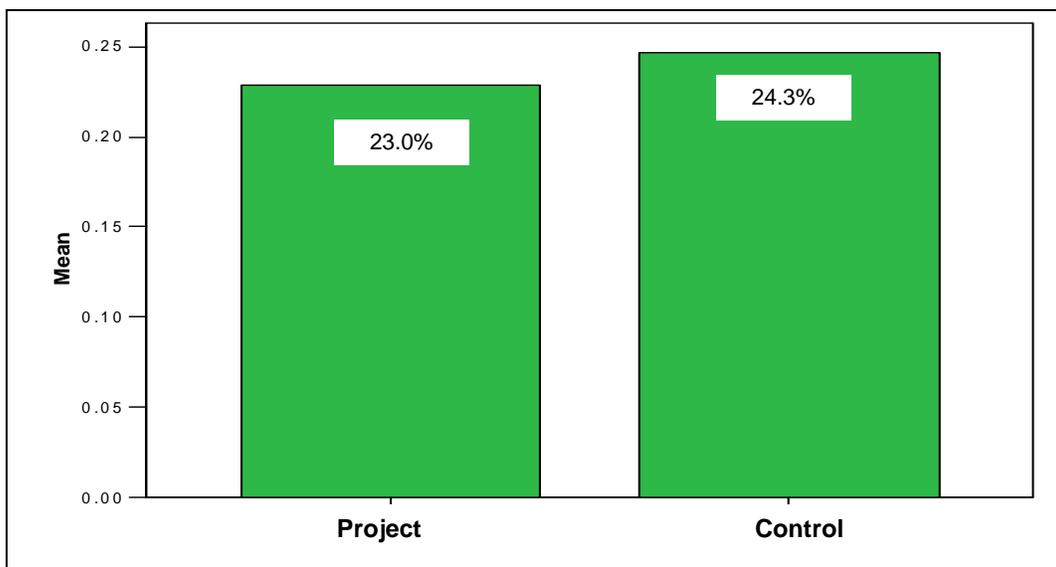
The overall mean percentage of the Grade 7 learners tested in the IEP baseline are discussed below.

#### 2.2.1.1 Comparison of project and control schools

##### 2.2.1.1.1 Performance on overall test

Overall, the Grade 7 learners performed poorly on the Grade 6 Mathematics test. In project schools, the mean score was 23% while in control schools it was 25%.

**Graph 14:** Performance of Grade 7 learners on the Mathematics test: comparison of overall mean percentages between project and control schools<sup>23</sup>



The statistics suggest that, at this stage, control schools are performing better than project schools on the Grade 6 Mathematics test. A T-test ( $p=0.141$ ) revealed that these differences were not significant ( $p<0.05$ ).

These means attained by Grade 7 learners are well below expected levels as specified by the curriculum and suggest that these learners have not yet mastered Mathematics concepts required for their grade.

<sup>23</sup> Refer to table (I) in Appendix G.

### 2.2.1.1.2 Level of difficulty

Similar to the Grade 3 Numeracy test, the Grade 6 Mathematics test is diagnostic in two ways: by skill and by grade level of difficulty. Thus each item is classified according to the skill it assesses and whether it does this at a Grade 3, Grade 4, Grade 5, Grade 6 or Grade 7 level of difficulty. Again, a score of 50% was used as a benchmark and we calculated the proportion of learners who achieved this benchmark at each of the levels of difficulty.

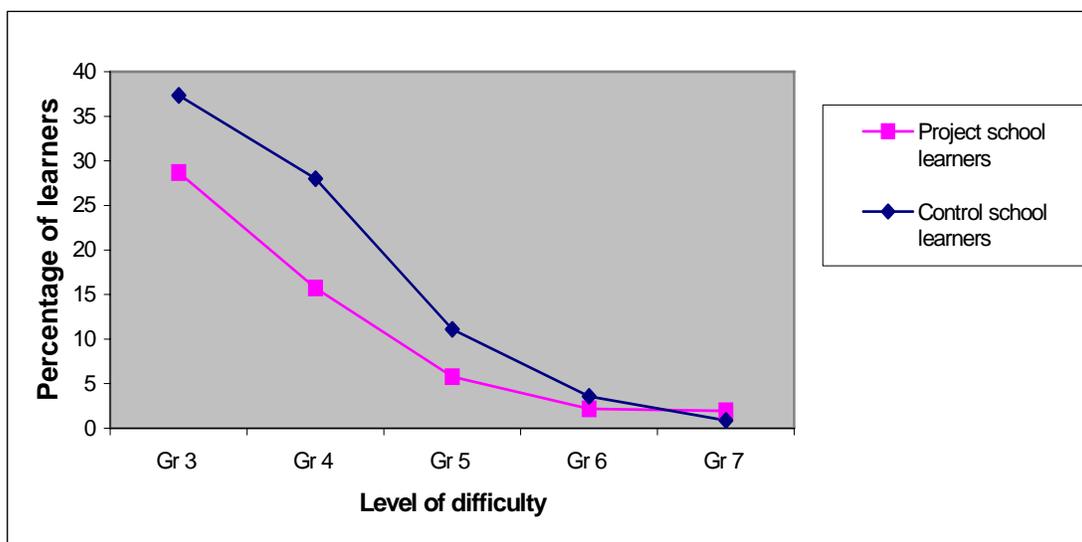
The number of learners achieving a mean of 50% or more decreased proportionally as the level of difficulty increased. This is clearly shown in table 9 below.

**Table 9:** Number of Grade 7 learners achieving 50% or more (per group) at each level, on the Mathematics test

Level of difficulty	Group	Total no. of learners tested	No. of learners who achieved a mean of 50% or more	% of total no. of learners
Grade 3	Project	1283	368	28.7
	Control	225	84	37.3
Grade 4	Project	1283	202	15.7
	Control	225	63	28.0
Grade 5	Project	1283	74	5.8
	Control	225	25	11.1
Grade 6	Project	1283	28	2.2
	Control	225	8	3.6
Grade 7	Project	1283	25	1.9
	Control	225	2	0.9

As evident in the above table, more learners in project schools who were tested in the baseline were able to cope with Grade 3 level items (29%) than they were able to deal with Grade 7 level items (2%). In control schools, there were more learners than in project schools achieving a mean score of 50% or more at all grade levels, except for Grade 7 level items where only two learners (0.9%) achieved a mean of 50% or more. This comparison is depicted in graph 15 below.

**Graph 15:** Percentage of Grade 7 learners in project schools who achieved 50% or more for each level of difficulty on the Mathematics test: comparison between project and control schools.



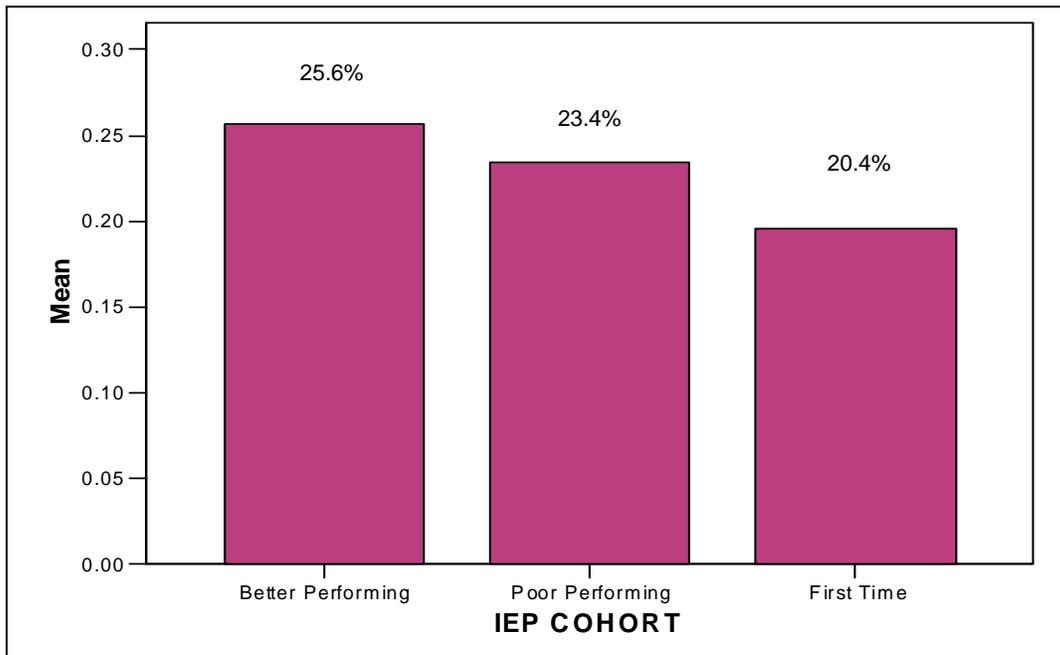
The graph clearly shows that the level of competences at each of these levels decreases as the difficulty increases. The data also suggest that most of the Grade 7 learners tested in the baseline are performing at three grades or more below expected levels. This pattern is more evident in project schools than control schools.

## 2.2.1.2 Performance of project schools

### 2.2.1.2.1 IEP cohort classification

Graph 16 compares the overall mean percentage for each of the three cohorts.

**Graph 16:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by IEP cohort classification) on the Mathematics test<sup>24</sup>



The data above show that the Better Performing schools are indeed performing the best overall. This is followed closely by the Poor Performing cohort, while the first group of First Time New Primaries performed the worst on the Mathematics test. The mean was below 30% across all three cohorts. There was no significant difference between the Better Performing cohort and the Poor Performing cohort, but the mean of the First Time New Primary cohort differs significantly from the other two cohorts at a 0.05 level.<sup>25</sup>

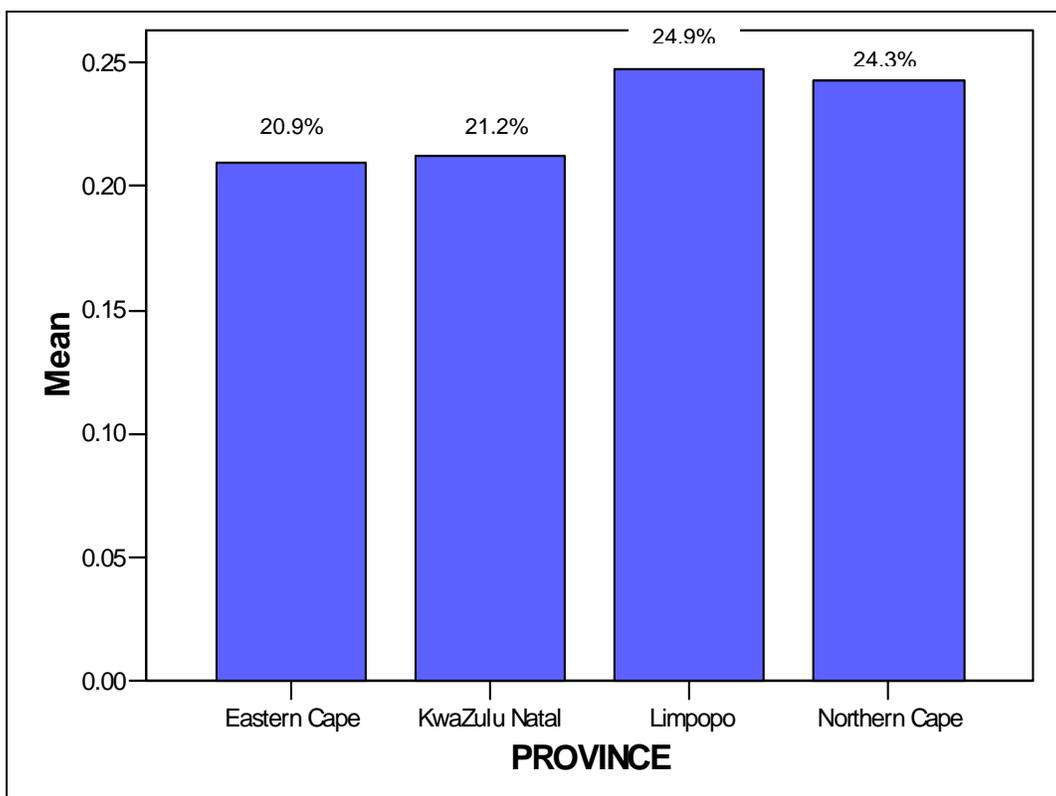
### 2.2.1.2.2 Provinces

A disaggregation of the results by province revealed that Limpopo performed favourably in relation to the other provinces, with an overall mean score of 25%. Northern Cape followed closely with 24% and Eastern Cape performed least well with an overall performance rate of just over 20%. This is illustrated below.

<sup>24</sup> Refer to table (m) in Appendix G.

<sup>25</sup> An ANOVA test of significance reveals an F-statistic less than 0.05, which indicates that at least one group is different. In determining where the significant difference lies, a Dunnett C test of comparison was run as equal variances are not assumed.

**Graph 17:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by province) on the Mathematics test<sup>26</sup>



Compared to the provincial performance of the Grade 4 learners on the Numeracy test – where Limpopo and Northern Cape were the poorer performing provinces and Eastern Cape the strongest performing – on the Mathematics test, the trends are reversed: Limpopo and Northern Cape were the Better Performing provinces overall, while Eastern Cape was the weakest.

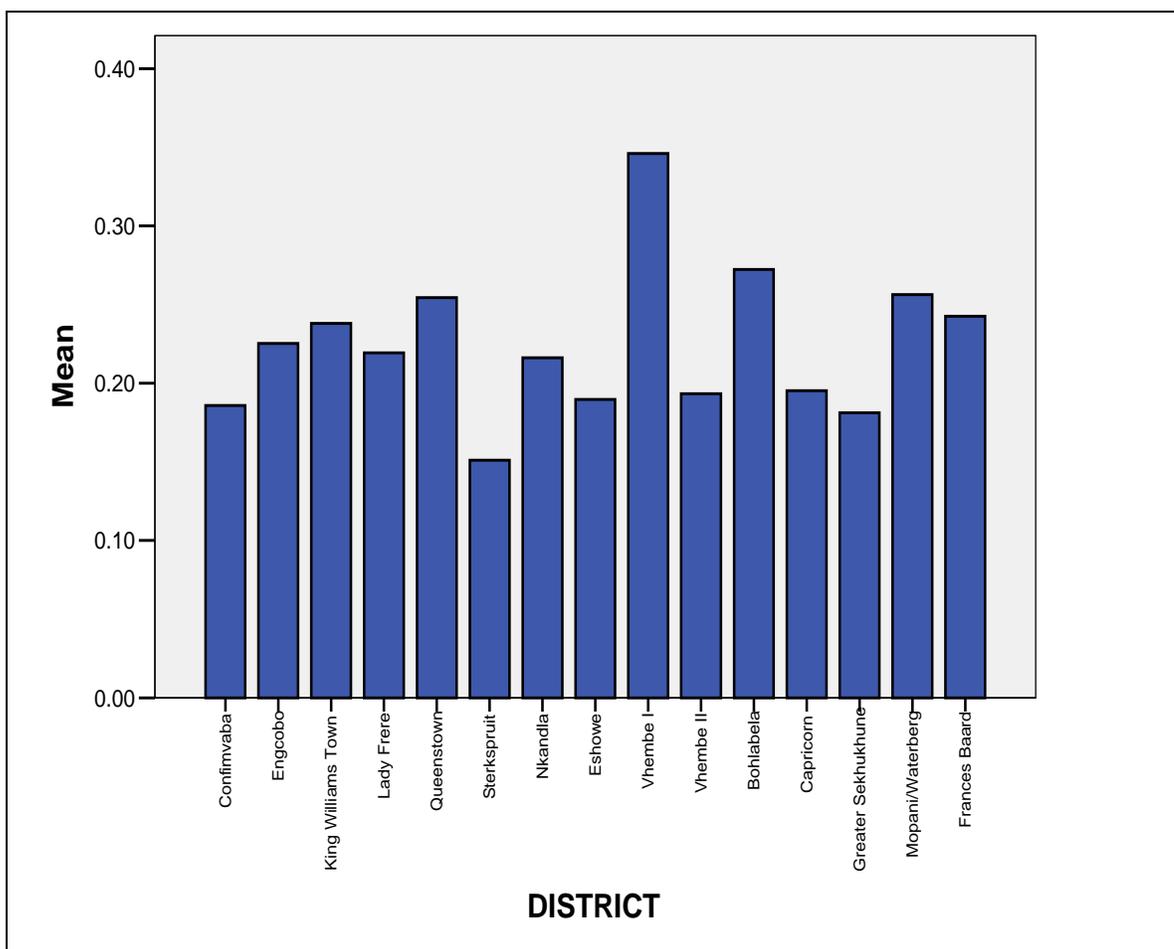
### 2.2.1.2.3 Districts

Overall, most districts (73% or 11 of the 15 districts tested) are performing with a mean of less than 25%. Only two districts are performing higher than this, with Vhembe I showing the best overall performance (35%). This is a surprising finding, because Vhembe I achieved a very poor result in the Numeracy test with the Grade 4 learners.

Sterkspruit continues to be among the poorest performing districts, as the overall means for this district were among the lowest in both the Numeracy and Mathematics tests.

<sup>26</sup> Refer to table (n) in Appendix G.

**Graph 18:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by district) on the Mathematics test<sup>27</sup>



#### 2.2.1.2.4 Gender

The overall mean percentage achieved by Grade 7 female and male learners in project schools is tabulated below.

**Table 10:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by gender) on the Mathematics test

Gender	Mean %	N	Std. deviation
Female	22.8	656	10.908
Male	23.2	622	10.703
Total *	23.1	1278	10.807

\* The total does not equal 1283 as five learners did not reveal their gender and are therefore considered missing cases.

On the Grade 6 Mathematics test, male learners performed marginally better than females but this is not statistically significant.<sup>28</sup> Both gender groups are performing at relatively poor levels (lower than 25%).

<sup>27</sup> Refer to table (o) in Appendix G.

<sup>28</sup> This is supported by an Independent Sample T-test, which reveals that there is no significant differences between the two gender groups ( $p > 0.05$ ).

### 2.2.1.2.5 Knowledge/skill domains

In constructing the Grade 6 test the four LOs were disaggregated into the following Mathematical competences, using the AS specified in the RNCS:

- LO1:**
- Ordering, comparing and representing whole numbers
  - Ordering, comparing and representing fractions and decimals
  - Place value
  - Rounding off
  - Adding and subtracting of whole numbers
  - Multiplying and dividing whole numbers
  - Operations with fractions, decimals and percentage

- LO2:**
- Number patterns and input/output values
  - Geometric patterns
  - Equations and equivalent expressions

- LO3:**
- 2-D shapes
  - 3-D shapes
  - Transformation/shapes within shapes
  - Perspective and position

- LO4:**
- Time
  - Mass
  - Capacity
  - Length

Each of the LOs was tested across the five difficulty levels: Grades 3 to 7.

In comparing overall performance on each of the four LOs, project schools performed slightly worse than control schools on all skills except LO3 and LO4. This was particularly so for LO1 skills, where the difference was 5% less than control schools.<sup>29</sup>

Although a slightly lower performance in LO2 was seen in project schools, the difference was very slight (1%) and not statistically significant.

For LO3 skills, project schools performed better than control schools but this difference (1.1%) was not statistically significant. Similarly, for LO4, the difference for project and control schools was 1.6%; this was not statistically significant.

These statistics show that, apart from LO1 skills, both project and control schools are performing at similar levels.

**Table 11:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by group) across the four LOs on the Mathematics test

Group	Statistics	LO1	LO2	LO3	LO4
Project schools	Mean %	22.6	36.3	20.4	16.3
	N	1283	1283	1283	1283
	Std. deviation	15.780	15.400	14.251	13.534
Control schools	Mean %	27.7	37.3	19.3	14.7
	N	225	225	225	225
	Std. deviation	19.640	16.898	14.672	12.052

<sup>29</sup> According to an Independent Sample T-test, this difference is statistically significant ( $p < 0.05$ ).

In project schools, Grade 7 learners performed the best in LO2 skills, which deal with number patterns and input/output values, geometric patterns and equations and equivalent expressions. An average of 36% was achieved and this was the LO in which learners performed the best.

Learners in project schools performed second best in LO1 skills, although the mean was not very high (23%).

For LO3 items, which look at 2-D shapes, 3-D shapes, transformation/shapes within shapes and perspective and position, learners in project schools accomplished a mean of 20%.

However, learners in project schools struggled the most with items dealing with LO4 skills (i.e. measurement and time), where a mean of 16% was achieved.

Similarly, control schools showed their greatest strength to be in LO2, while their greatest weakness was in items that assessed LO4 skills.

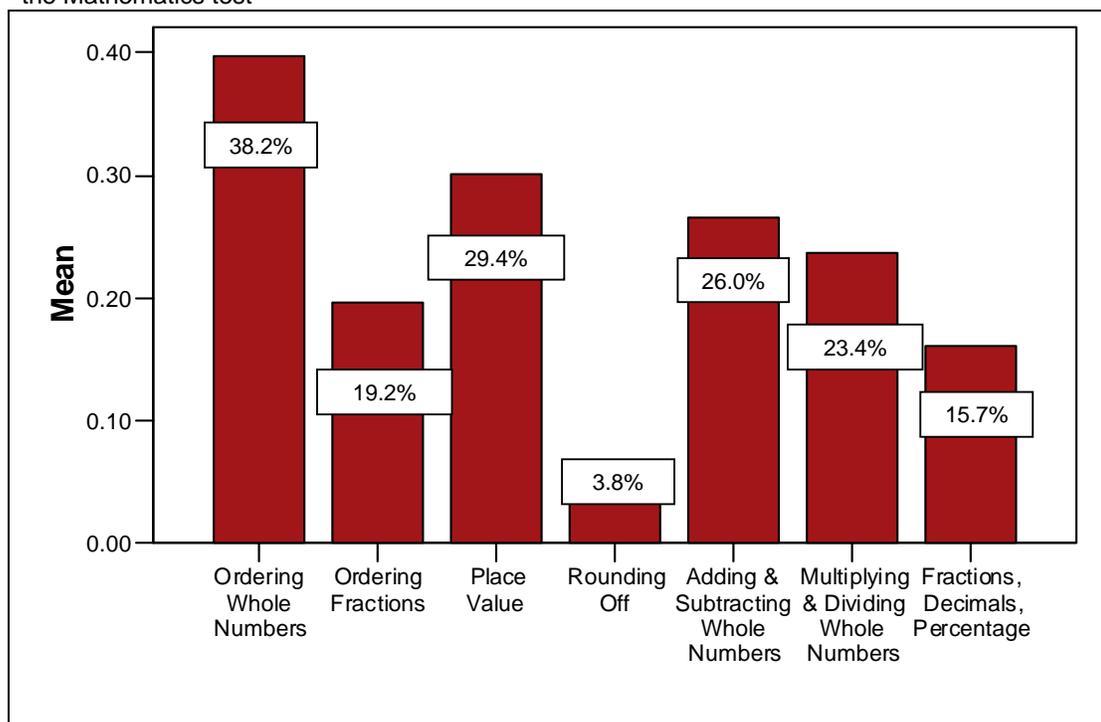
Again, attention is drawn to the fact that mean results in all the LOs assessed on the JET Grade 6 Mathematics test, except in LO2, did not meet or exceed the 25% mark. This is cause for grave concern, particularly as learners in Grade 7 were tested on the knowledge and skills of the grade they had passed in the *previous* year.

The remainder of this section looks at the performance of the Grade 7 learners for each of the LOs individually. This will point to the various strengths and weaknesses among the Grade 7 learners in project schools tested in the baseline.

**Learning Outcome 1**

Graph 19 below compares the overall mean percentage achieved by Grade 7 learners in project schools across the different skills in LO1.

**Graph 19:** Overall mean percentage for Grade 7 learners in project schools for LO1 skills on the Mathematics test<sup>30</sup>



<sup>30</sup> Refer to table (p) in Appendix G.

In terms of LO1 skills, most Grade 7 learners in project schools seem to have the basic Numeracy skills, such as ordering whole numbers to at least 3 digit numbers (e.g. Question 3 of Task 1, which required learners to arrange 3 and 4 digit numbers from smallest to biggest), and recognising the place value of digits in whole numbers (e.g. Question 4 in Task 4, where learners had to write the words ‘six thousand, four hundred and twenty one’ in numbers).

Grade 7 learners can, to some extent, perform calculations using appropriate symbols to solve problems, which includes addition of whole numbers (e.g. Question 11 in Task 1:  $6327 + 364 = \underline{\quad}$ ), and to a lesser extent with subtraction of whole numbers. In the more complex operations, such as multiplication or division, learners performed less well. Some learners continue to solve problems using concrete approaches (such as drawing sticks to perform computations).<sup>31</sup>

When fractions are encountered, the mean score drops dramatically, whether it involves ordering and comparing of fractions or performing operations (addition, subtraction) with fractions. Almost all learners in project schools could not correctly answer questions such as Question 24 of Task 1:

$$\frac{2}{3} + \frac{1}{6} = \underline{\quad}.$$

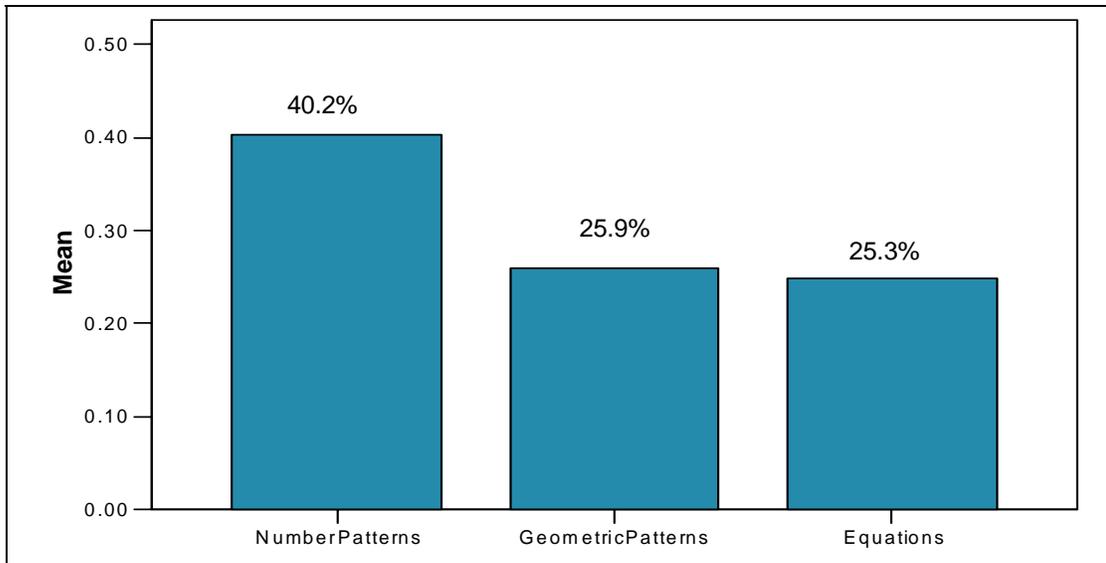
Grade 7 learners in project schools struggled the most with rounding off skills, where a mean of less than 10% was achieved. An example of such an item is Question 18 of Task 1, where learners had to round off 22745 to the nearest thousand. One-fifth of the learners tested in Grade 7 left this item blank.

Apart from a few strengths, the mean percentage for skills for LO1 was lower than 40%. This suggests that the majority of learners, particularly in project schools, have not sufficiently mastered skills for LO1, which deals with numbers, operations and relationships.

**Learning Outcome 2**

The comparison across LO2 skills is shown in graph 20 below.

**Graph 20:** Overall mean percentage for Grade 7 learners in project schools for LO2 skills on the Mathematics test<sup>32</sup>



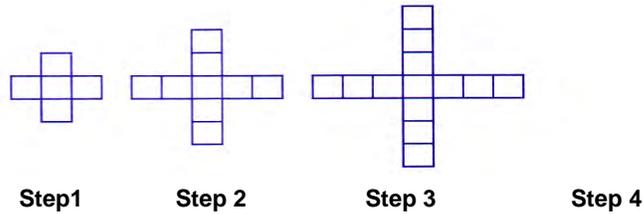
<sup>31</sup> According to fieldworker observations during the data collection/test administration.

<sup>32</sup> Refer to table (q) in Appendix G.

The above statistics clearly show that Grade 7 learners in project schools are more able to recognise or create number patterns (e.g. Question 2 of Task 1, where learners had to fill in the next number in this pattern: 950 850 750 ?) than they are to solve equations or identify or calculate geometric patterns (e.g. question 13 of Task 1 shown below).

---

13. Look at the square pattern below:



How many squares will there be in Step 4 of this pattern? Circle the letter that shows the answer.

- |    |    |    |    |
|----|----|----|----|
| A. | 16 | C. | 20 |
| B. | 17 | D. | 15 |

---

An example of an item that assessed 'equations' (question 7 of Task 1), is shown below.

---

7. Barry has 52 marbles. He loses some marbles. He now has 31 marbles left. What calculation below will tell you how many marbles he lost? Circle the letter that shows the answer.

- |    |                |
|----|----------------|
| A. | $52 + 31$      |
| B. | $52 - 31$      |
| C. | $31 + 52$      |
| D. | $52 \times 31$ |

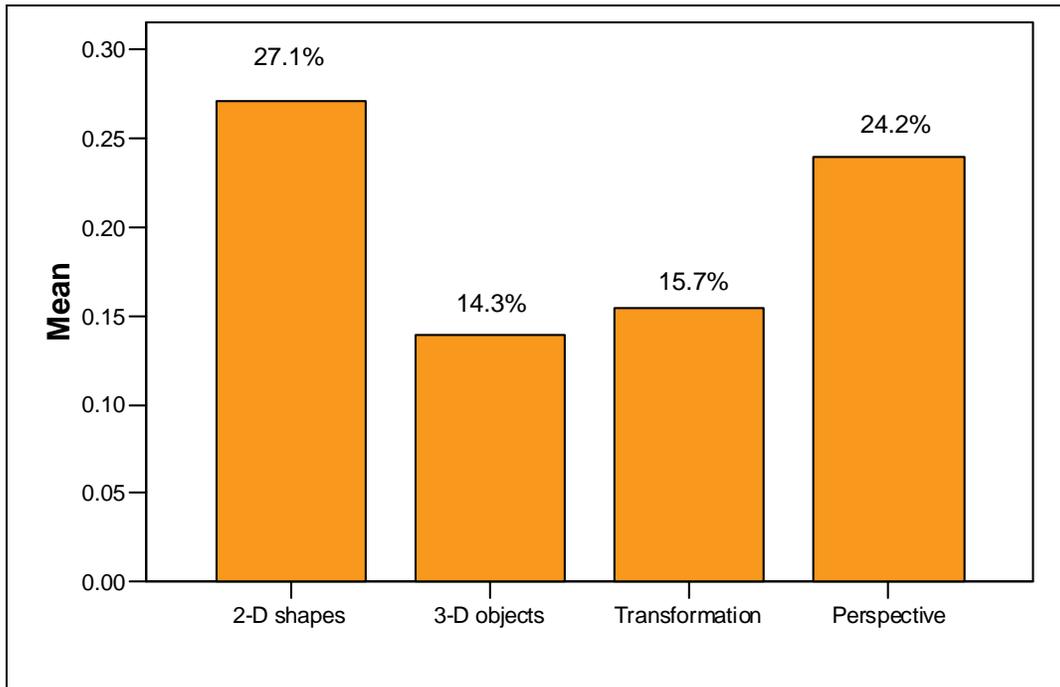
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Most items that required learners to solve algebraic equations were presented in the format shown above, i.e. as 'word problems'. These items require some reading and, since literacy levels of learners are poor, this may have contributed to the poor performance.

**Learning Outcome 3**

LO3 deals primarily with space and shape (geometric principles). As can be seen from graph 21 below, the mean for all LO3 skills is below 30%.

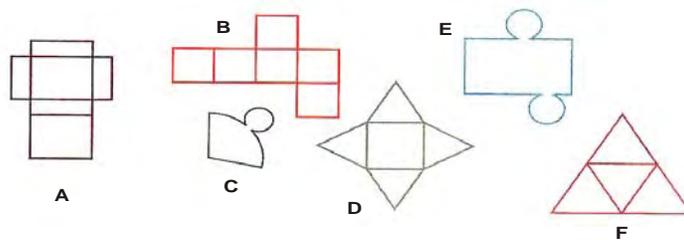
**Graph 21:** Overall mean percentage for Grade 7 learners in project schools for LO3 skills on the Mathematics test<sup>33</sup>



Learners performed the best on items that dealt with 2-D shapes (27%) and perspective (24%). However, for 3-D objects and transformation type questions, a very low mean of approximately 15% was achieved.

The fact that the Grade 7 learners in project schools performed the worst on skills that deal with transformation (or shapes within shapes) and 3-D objects is not a surprising finding, particularly given that these skills are pitched at either a Grade 5 or Grade 6 level of difficulty. An example of such an item is Question 14 of Task 3.

**14. Which of the nets below can be folded into a pyramid?**



**Write the letter of the object.**

\_\_\_\_\_

The results show that most learners do not have an understanding of 2-D and 3-D shapes – what they look like, how they change, how they move, or how they appear when viewed from different viewing positions. It is also possible that learners are not

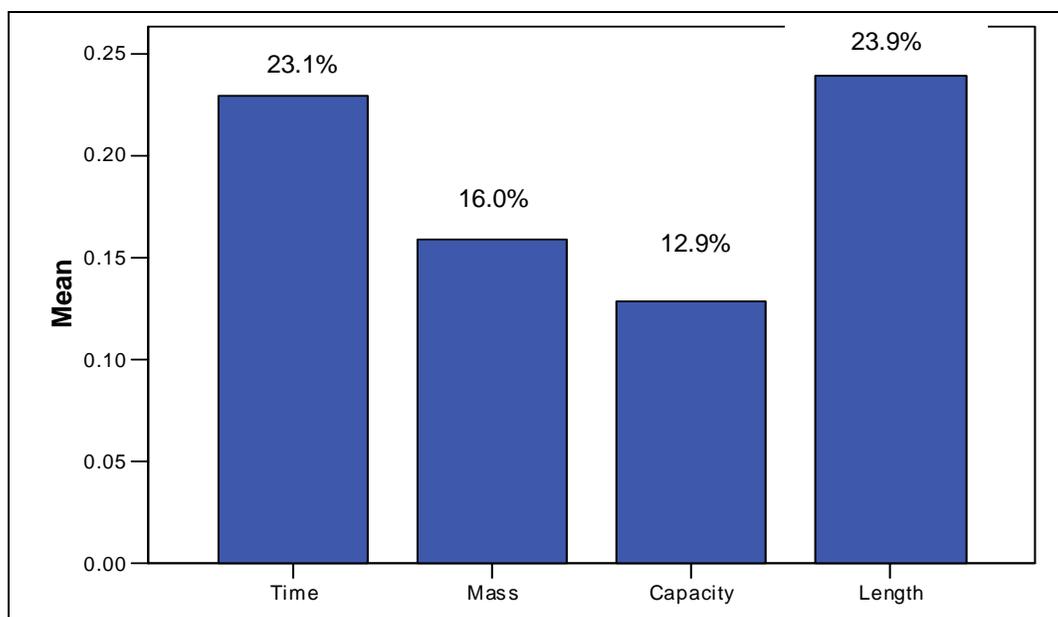
<sup>33</sup> Refer to table (r) in Appendix G.

familiar with the terminology itself (e.g. 'rotate' or 'reflect'), especially since most of the learners tested are not English first language speakers.

#### **Learning Outcome 4**

LO4 deals primarily with measurement (such as time, mass, capacity and length). As reflected in graph 22 below, the means for time and length are substantially higher than the means for mass and capacity.

**Graph 22:** Overall mean percentage for Grade 7 learners in project schools for LO4 skills on the Mathematics test<sup>34</sup>



It should again be noted that the Grade 7 learners in project schools are performing very poorly across all four LO4 skills, where the highest mean was 24%. This may be attributed to the fact that reading proficiency of these learners is not performing on a par with the standards expected by the RNCS.

## **2.2.2 Science**

This section looks at the performance on the Science test, which was administered to the same Grade 7 learners tested in the baseline for the Mathematics test. As with the other instruments, the discussion will look at:

- The overall performance on the test, comparing project schools to control schools;
- The number of learners achieving means of 50% or more; and
- The performance of project schools across IEP cohort classification, provinces, gender, and LOs.

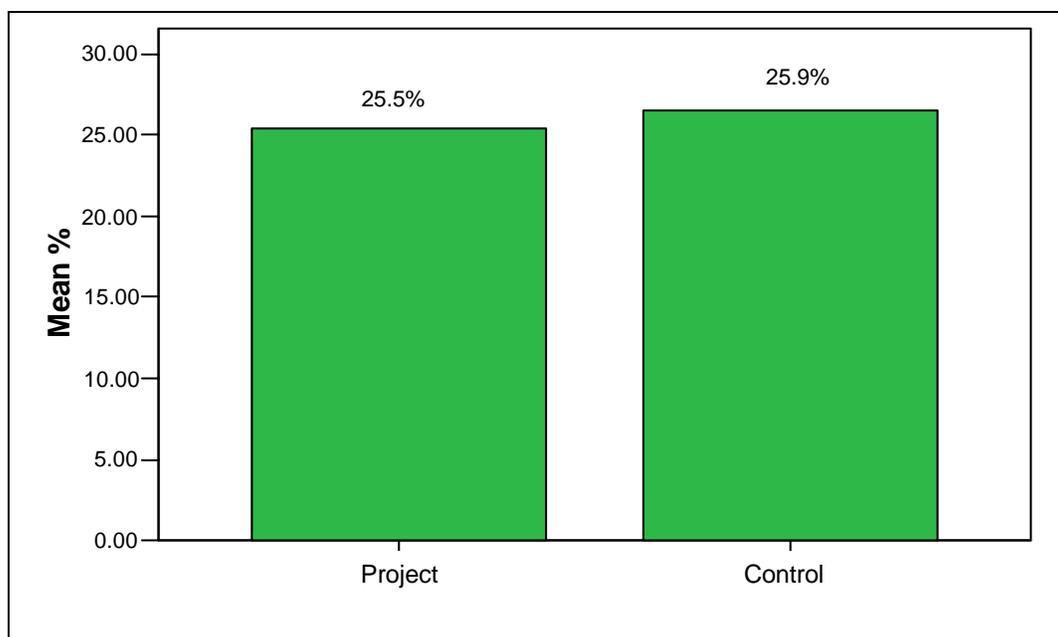
### **2.2.2.1 Comparison of project and control schools**

#### **2.2.2.1.1 Performance on overall test**

<sup>34</sup> Refer to table (s) in Appendix G.

Graph 23 below compares the overall mean percentages achieved by project schools and control schools.

**Graph 23:** Comparison of overall test mean between project and control schools on the Science test<sup>35</sup>



The data show that in the Grade 6 Science test, project schools performed less well than control schools by a marginal difference of 0.4%. A test of significance shows that there are no significant differences in means for the groups ( $p > 0.05$ ).

The mean for both project and control schools was below 30%, which is a poor performance overall.

#### 2.2.2.1.2 Level of difficulty

The Grade 6 Natural Sciences test is aligned to the LOs and AS specified by the RNCS for the Grade 6 level. The 50% benchmark was used to determine the number of learners who were able to achieve this benchmark.

As shown in table 12 below, of a total of 1288 learners who were tested on Science in project schools, only 9% were able to attain the 50% benchmark. In control schools, the percentage of learners attaining this benchmark was slightly higher with 12%. This is a disappointingly low figure as it suggests that 90% of learners in Grade 7 who were tested in the baseline have very low competences in basic Science skills.

**Table 12:** Number of Grade 7 learners achieving 50% or more (as disaggregated by group) on the Science test

Group	Total number of learners tested	Total no. of learners who achieved 50% or more	% of total no. of learners
Project	1288	107	8.3%
Control	224	31	13.8%

<sup>35</sup> Refer to table (t) in Appendix G.

However, a contributing factor may be that learners are not able to read properly and, therefore, do not understand what is being asked of them. For most of the open-ended questions, where learners had to explain something, many learners (over 80%) were simply rewriting the question *verbatim*. In the case of those who did try to write an explanation, the answers did not make sense, having nothing to do with what was being asked in the question. Evidence of the poor reading and writing abilities is presented below.

Appendix H provides scanned examples of how learners answered some of the open-ended Science questions.

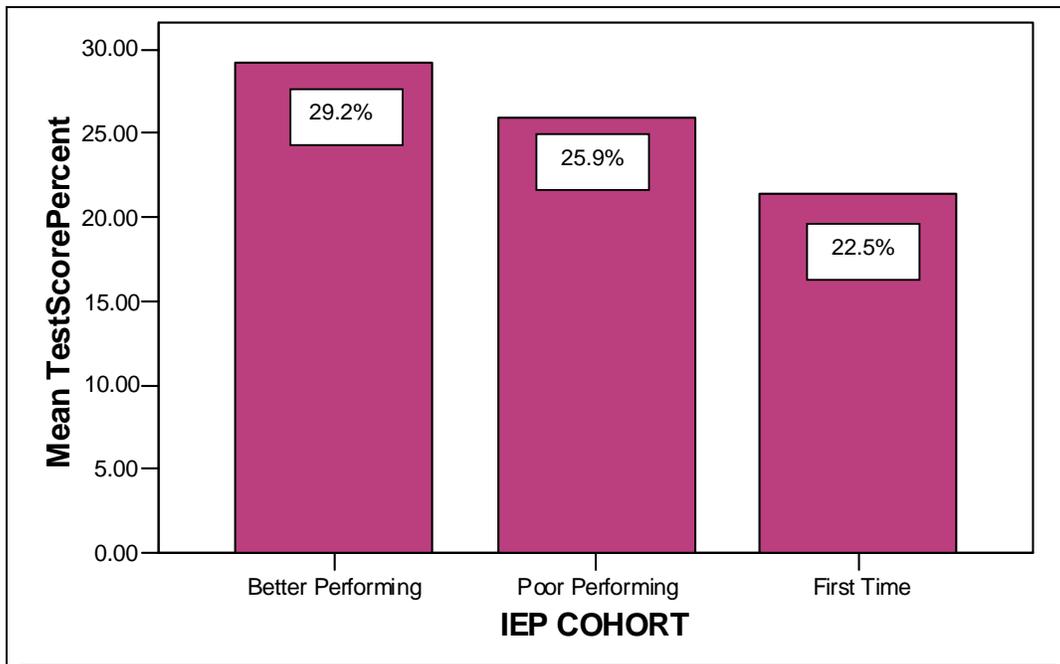
However, it should be noted that all learners tested were second or third language English speakers, and poor levels of proficiency in English probably had a very marked effect on performance. In some cases, excluding Northern Cape where learners were tested in Afrikaans, learners tried to answer questions in their home language (this was especially evident among KZN learners).

### 2.2.2.2 Performance of project schools

#### 2.2.2.2.1 IEP cohort classification

Graph 24 below presents the overall mean percentage for Grade 7 learners in project schools across the three cohorts.

**Graph 24:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by IEP cohort classification) on the Science test<sup>36</sup>



Better Performing schools are performing better than the Poor Performing schools, which in turn are performing better than the First Time New Primaries. Statistical tests showed that there were no significant differences between the Better

<sup>36</sup> Refer to table (u) in Appendix G.

Performing cohort and the Poor Performing cohort, but the First Time New Primaries differ significantly from the other two cohorts at a 0.05 level.

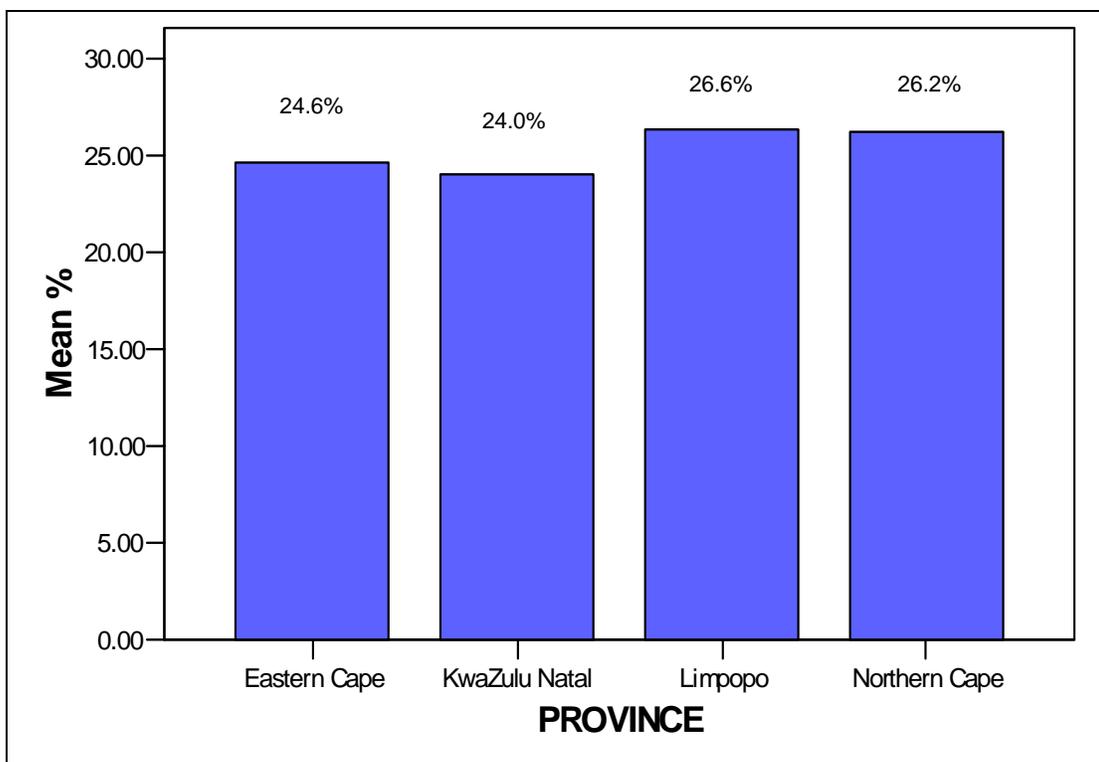
#### 2.2.2.2.2 Provinces

Provincially, Limpopo and Northern Cape performed the best, with an overall mean of just over the 25% mark.

KwaZulu Natal performed the worst of the four provinces in this LA, with a mean of 24%.

Graph 25 below depicts the performance of Grade 7 learners in project schools across the four provinces.

**Graph 25:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by province) on the Science test<sup>37</sup>



#### 2.2.2.2.3 Districts

When the data are disaggregated by district, Bohlabela and Vhembe I were the best performing districts in the Science test, with a mean of 38%.

Queenstown and Pixley Ka Sema also had means above 33%.

The provinces with the lowest mean percentages (where the mean scores were lower than 17%) were:

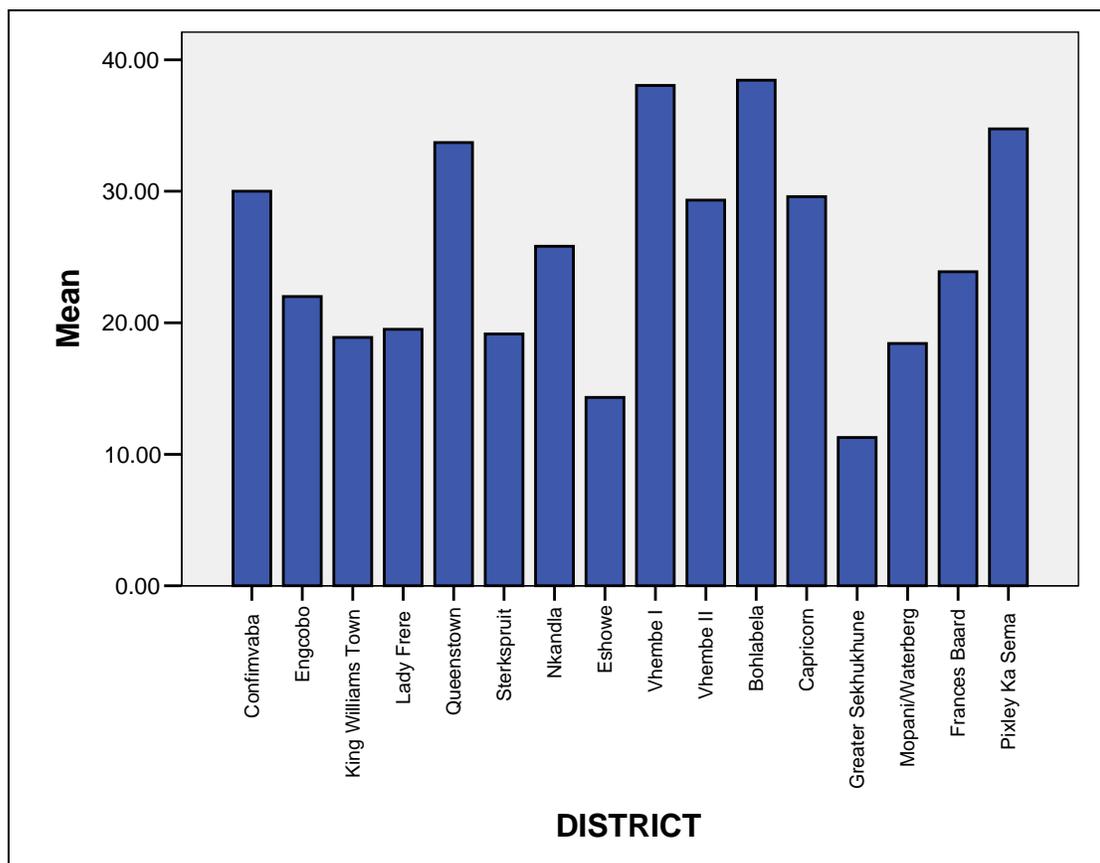
- Greater Sekhukhune;

<sup>37</sup> Refer to table (v) in Appendix G.

- Eshowe; and
- Mopani/Waterberg.

Graph 26 provides a graphic representation of the means achieved by each of the districts tested.

**Graph 26:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by district) on the Science test<sup>38</sup>



#### 2.2.2.2.4 Gender

Female learners performed marginally better than males, but this is not statistically significant. This means that the Grade 7 female and male learners are performing at similar levels.

**Table 13:** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by gender) on the Science test

Gender	Mean %	N	Std. deviation
Female	25.7	651	15.99962
Male	25.3	633	15.32609
Total *	25.5	1284	15.66647

\* The total does not equal 1288 as four learners did not reveal their gender and are therefore considered missing cases.

<sup>38</sup> Refer to table (w) in Appendix G.

### 2.2.2.2.5 Knowledge/skill domains

The development of the Science instrument focused on the LOs, AS and Core Knowledge and Concepts for Natural Sciences of the RNCS. The test focused on scientific investigations (LO1), constructing scientific knowledge (LO2), and Science, environment and society (LO3). Although the test was designed to take the average learner 60 minutes to complete, learners tested in the baseline were allowed 90 minutes.

#### **a) Comparing project and control schools**

Table 14 below compares the mean percentage correct for the Grade 7 learners in project and control schools on each of the three Science LOs.

**Table 14:** Comparison of overall test mean between project and control schools on each of the three LOs for Science

Group	Statistics	LO1	LO2	LO3
Project	Mean	27.0	26.2	12.5
	N	1288	1288	1288
	Std. deviation	22.336	17.424	16.205
Control	Mean	24.9	28.4	14.3
	N	224	224	224
	Std. deviation	23.587	18.928	20.080

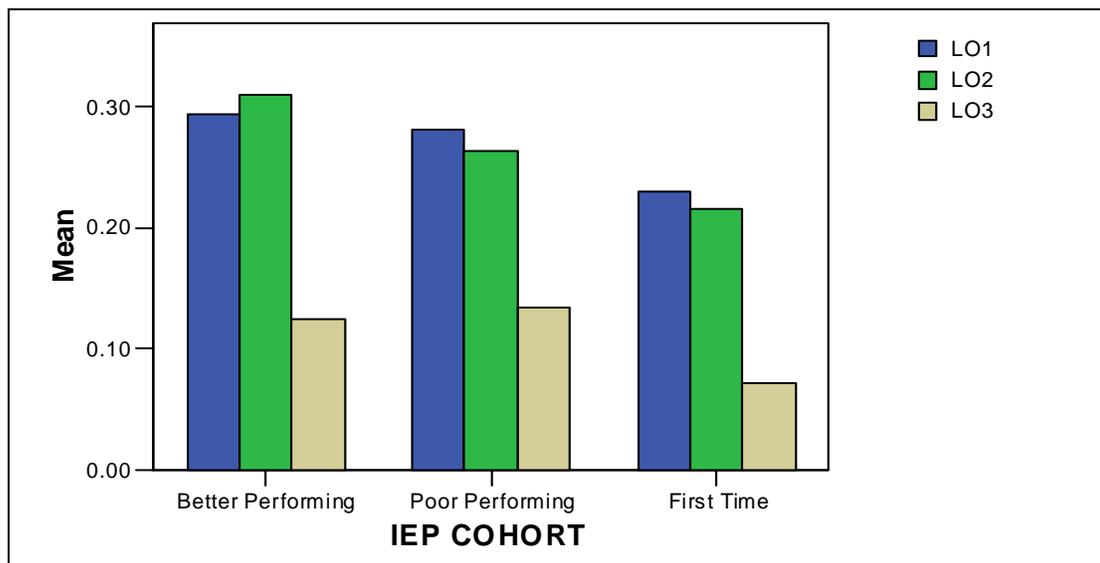
LO3 (i.e. Science, Society and Environment) was answered least well by learners overall. This LO required learners to apply knowledge of Science to everyday life. Project school learners obtained a 13% result overall for this LO, while control schools obtained a 14% result overall. Questions that dealt with LO1 skills (i.e. Investigations) were also not answered well by learners. Project schools obtained a 27% mean for this LO, while control schools performed less favourably, with a mean score of 24%. Although the means for LO1 were low, learners performed the best on this LO compared to LO2 and LO3.

As with the Mathematics test, overall means scores did not exceed the 30% mark.

#### **b) Comparison by IEP cohort classification**

Graph 27 compares the overall test mean of project schools for each of the three Science LOs per IEP cohort classification.

**Graph 27:** Comparison of overall test mean of project schools (as disaggregated by IEP cohort classification) on each of the three LOs for Science<sup>39</sup>



The Better Performing cohort of schools performed slightly better than the Poor Performing cohort and the First Group of New Primaries across all skills, except on LO3 where the Poor Performing cohort of schools achieved marginally better scores than the Better Performing cohort. The first group of First Time New Primaries performed the worst overall across all three skills.<sup>40</sup>

None of the cohorts achieved means higher than 30% on any of the LOs. Generally all cohorts performed the best on LO1, which involves scientific investigations.

LO3 was performed least well by learners in all cohorts. This suggests that learners in Grade 7 are not able to answer questions that link Science to society and the environment.

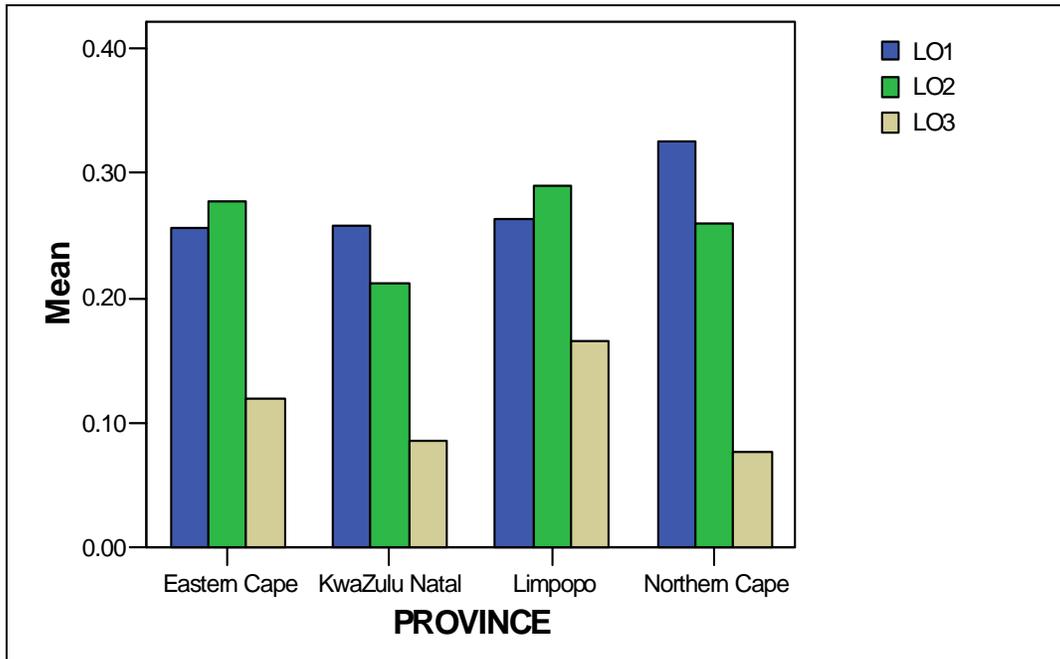
***c) Comparing performance by province***

When the data are disaggregated by province, Northern Cape performed the best on LO1 compared to the other provinces, which performed at similar levels. Limpopo performed the best in LO2 skills, while KZN performed the worst on the same LO. LO3 was the weakest LO across all provinces, particularly in the Northern Cape and KZN. Limpopo performed the best but the overall mean was still a low 17%. These comparisons are shown in graph 28 below.

<sup>39</sup> Refer to table (x) in Appendix G.

<sup>40</sup> To determine whether the differences in means for LO1, LO2 and LO3 are significant, an ANOVA test was run, followed by pair wise comparisons. The statistics revealed that for LO1, there were no significant differences between the BP and PP cohorts, but the mean of the FT cohort differed significantly from that of the BP and PP cohorts at a 0.05 level. For LO2, there were no significant differences between the PP and FT cohorts, but the mean of the BP cohort differed significantly from that of the PP and FT cohorts at a 0.05 level. For LO3, only the means of PP and FT differed significantly at 0.05.

**Graph 28:** Comparison of overall test mean of project schools (as disaggregated by province) on each of the three LOs for Science<sup>41</sup>



<sup>41</sup> Refer to table (y) in Appendix G.

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# CHAPTER THREE:

## SUMMARY & RECOMMENDATIONS

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We structure the following set of conclusions and recommendations around our six research questions:

**1. At what level are learners performing, overall, in sample IEP schools in Numeracy (Grade 3), Literacy (Grade 3), Mathematics (Grade 6) and Science (Grade 6)?**

The design of the JET tests is informed by the core competences or LOs for the target grades as contained in the RNCS.

The baseline findings show that all results across the Numeracy, Mathematics and Science LAs did not meet, or very seldom exceeded, the 30% mark. This was cause for concern, particularly as learners in Grade 4 or 7 were tested on the knowledge and skills of the grade they had passed in the previous year. For Literacy, the mean score did not exceed 45%. The mean overall percentage scores are shown below.

<b>Learning Area</b>	<b>Baseline result</b>
Grade 3 Numeracy	26%
Grade 3 Literacy	42%
Grade 6 Mathematics	23%
Grade 6 Science	26%

**2. Are there differences between IEP and control schools in mean scores for the four Learning Areas? If any, are the differences significant?**

In order to determine whether the IEP programme is indeed having an impact, it is necessary to compare performances in schools that are influenced by the IEP programme to non-IEP schools.

The baseline findings show that the performance levels between the two groups – project and control schools – were more or less the same. The maximum difference between the two groups was 4% and this was for the Grade 3 Literacy paper. These scores indicate that the control schools do provide valid points of comparison with IEP schools.

**3. How are learners in project schools (across the different cohorts) performing in relation to focus Learning Outcomes and Assessment Standards of the national curriculum?**

A breakdown of the performance of project schools of each knowledge/skill domain is found below.

- **Grade 3 Numeracy:** The Grade 4 learners in both the project schools and the control schools are performing best on basic operations particularly in **addition**, followed by **counting, ordering and representing numbers** and then **subtraction** and **multiplication**. However, learners seem to have the greatest difficulty in correctly answering items that deal with division skills.
- **Grade 3 Literacy:** Grade 4 learners in both the project schools and the control schools are performing best where **reading and viewing** skills are required. This is considered the easiest of the LOs and higher mean percentages in this LO are therefore to be expected. **Thinking and reasoning** and **writing** were the skills that both project school learners and learners in control schools answered least well.
- **Grade 6 Mathematics:** In project schools, Grade 7 learners performed the best on items dealing with number patterns and input/output values, geometric patterns and equations and equivalent expressions (i.e. **LO2** items). An average of 36% was

achieved. In terms of **LO1** items, most Grade 7 learners in project schools seem to have the basic Numeracy skills, such as ordering whole numbers to at least 3 digit numbers and recognising the place value of digits in whole numbers. In the more complex operations, such as multiplication or division, learners performed less well. Grade 7 learners struggled the most with rounding off skills and fractions. For **LO3** items, which look at 2-D shapes, 3-D shapes, transformation/shapes within shapes and perspective and position, learners accomplished a mean of close to 20%. However, learners struggled the most with items dealing with **LO4** (a mean of 16% was achieved), where mass and capacity were the areas with the lowest mean scores.

- **Grade 6 Science:** Learners performed the best on items that dealt with **LO1** (i.e. Investigations). Project schools obtained a 27% mean for this LO. In terms of **LO2**, learners achieved an overall mean of 26%. **LO3** (i.e. Science, Society and the Environment) was answered least well by learners overall. This LO required learners to apply knowledge of Science to everyday life. Project school learners obtained a 13% result overall for this LO.

**4. Are there statistically significant differences in learner performance among the different school cohorts?**

Overall, the Better Performing cohorts tended to perform better than both the Poor Performing and First Time New Primary cohorts, across all LAs. Tests of significance revealed that the difference between BP and PP cohorts was usually not statistically significant. The only exception was in Grade 3 Numeracy, where the difference in means between the BP and PP cohorts was found to be statistically significant. When the performances of these two cohorts (BP and PP) were compared to that of the FT cohort, the difference was found to be statistically significant at a 0.05 level for both LAs in Grade 6. However, the mean differences between FT and BP, and FT and PP, were not statistically significant for Grade 3 Numeracy and Grade 3 Literacy. This is shown more clearly below.

Learning Area	IEP cohort classification	Baseline result	Were differences statistically significant?
Grade 3 Numeracy	Cohort 1: BP	31%	- Btw BP & FT: No
	Cohort 2: PP	25%	- Btw PP & FT: No
	Cohort 3: FT	26%	- Btw BP & PP: Yes
Grade 3 Literacy	Cohort 1: BP	43%	- Btw BP & FT: No
	Cohort 2: PP	42%	- Btw PP & FT: No
	Cohort 3: FT	43%	- Btw BP & PP: No
Grade 6 Mathematics	Cohort 1: BP	27%	- Btw BP & FT: Yes
	Cohort 2: PP	23%	- Btw PP & FT: Yes
	Cohort 3: FT	20%	- Btw BP & PP: No
Grade 6 Science	Cohort 1: BP	29%	- Btw BP & FT: Yes
	Cohort 2: PP	26%	- Btw PP & FT: Yes
	Cohort 3: FT	23%	- Btw BP & PP: No

**5. How are female learners performing relative to male learners? Are the differences, if any, statistically significant?**

In gender terms, female learners tended to perform slightly better than the males, except in Grade 6 Mathematics. However, the difference in mean scores between female and male learners in this sample was not statistically significant.

**6. What areas can be identified as gaps in learner knowledge? Which gaps, based on the results of the baseline, should be addressed through more intensive and directed training of educators to increase the effectiveness of their teaching?**

It was abundantly clear, both to the fieldworkers administering the tests, and to the scorers marking them, that not only do most learners have little or no experience in writing tests of this kind, but their inability to engage with such tests is greatly exacerbated by very poor reading skills.

The learner baseline results indicate serious gaps, which require urgent attention if the IEP is to improve levels of learner performance. Generally, more than half of the learners tested are not performing at expected levels of difficulty as required by the RNCS. Service providers would do well to concentrate on the LOs and AS that were being answered poorly by learners, as identified in point 3 above.

**7. What recommendations can be made on the basis of the baseline results?**

There is no doubt that the most fundamental problem in all the schools tested is the very poor levels of reading exhibited by the learners. No progress will be possible in addressing shortcomings in Mathematics and Science, or in any other subject for that matter, until reading proficiency is significantly improved. Thus, the first priority for the IEP must be to institute a comprehensive programme for improving reading and writing.

A second fundamental problem lies in learners' poor understanding of the number system, and their inability to progress from the concrete methods appropriate to Grade 1 to an abstract understanding of numbers. Thus, in adding  $35 + 46$ , for example, learners will draw 35 marks on the page, followed by 46 marks, and will then proceed to count the total. The majority of higher order Mathematical concepts in the primary school are founded on a good understanding of the number system, and a facility in performing simple algorithms, without resorting to concrete methods. Thus, a second priority for the IEP must be to develop a facility with the fundamental arithmetic operations.

Essentially, what the results are showing is that Grade 4 and 7 learners are falling short of what is required for learners in Grades 3 and 6. Although IEP does have basic strategies in place to monitor performance over the project's lifespan, the baseline results point to a strong need to strengthen and drive the IEP strategies to improve learners' performance in Numeracy and Literacy, as well as Science, by at least 10%<sup>42</sup> by 2007.

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<sup>42</sup> Refer to Appendix I for IEP's performance monitoring plan to track learner performance over the next three years.

## APPENDIX B: GRADE 3 NUMERACY TEST ASSESSMENT FRAMEWORK

Knowledge/skills		Grade 1	Grade 2	Grade 3	Grade 4
Counting, ordering, comparing and representing numbers	Contextual		1.3	2.12 3.21	3.27
	Non-contextual	1.1	1.2 1.10 2.1 3.1	1.20 1.21 2.11 2.13 3.12 3.2 3.6	2.22 2.26 3.26 3.22
	Contextual	1.8	1.17 2.6	1.22 2.16	

<b>Addition</b>	<b>Non-contextual</b>	1.4 1.6	1.11 1.16 2.4 2.2	1.25 1.27 2.14 2.24 2.18 3.8 3.3 3.16 3.24	2.27 2.28
<b>Subtraction</b>	<b>Contextual</b>		2.7	1.23 2.19 3.5	
	<b>Non-contextual</b>	1.5 1.7	1.12 1.15 2.3 2.9 2.5	1.26 2.15 2.25 3.4 3.10 3.18	2.29

Knowledge/skills		Grade 1	Grade 2	Grade 3	Grade 4
Multiplication	Contextual		1.14 2.10 3.13	2.23 3.23 3.11	
	Non-contextual		1.13 1.19 2.8	1.24 2.17 3.7 3.14	
Division	Contextual	1.9	1.18 3.9	2.21 3.28 3.17 3.19	3.25
	Non-contextual			2.20 3.15	3.20

# APPENDIX C: GRADE 3 LITERACY TEST ASSESSMENT FRAMEWORK

**Legend:**

- R: Reasoning
- K: Knowledge (knowing facts and procedures)
- C: Use of Concepts
- P: Problem Solving and Analysis
- MCQ: Multiple Choice Question
- D: Difficult
- M: Moderate
- E: Easy

**Question 1:**

**The Upside-Down Mice (International Benchmark).**

Item Number:	Learning Outcome:	Assessment Standard:	SACMEQ Level:	Cognitive Category:	Time (in mins.)	Max. Score	Question Format:	Expected Difficulty:
Item 1	Reading and Viewing	The learner makes meaning of written text through reading.	Level 4	C, R	1	1	MCQ	E
Item 2	Reading and Viewing	The learner makes meaning of written text through reading.	Level 4	C, R	1	1	MCQ	E
Item 3	Reading and Viewing	The learner makes meaning of written text through reading.	Level 4	C, R	1	1	MCQ	M

Item 4	Reading and Viewing	The learner makes meaning of written text through reading.	Level 4	C, R	1	1	MCQ	D
Item 5	Reading and Viewing	The learner makes meaning of written text through reading.	Level 4	C, R	1	1	MCQ	D

**Question 2:**  
**My Body.**

<b>Item Number:</b>	<b>Learning Outcome:</b>	<b>Assessment Standard:</b>	<b>SACMEQ Level:</b>	<b>Cognitive Category:</b>	<b>Time (in mins.)</b>	<b>Max. Score</b>	<b>Question Format:</b>	<b>Expected Difficulty:</b>
Item 1	Reading and Viewing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of letters and words.</li> <li>The learner uses language for thinking and problem solving.</li> </ul>	Level 3 Level 5	C, P	1	1	Short Answer	M
Item 2	Reading and Viewing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of letters and words.</li> <li>The learner uses language for thinking and problem solving.</li> </ul>	Level 3 Level 5	C, P	1	1	Short Answer	E

Item 3	Reading and Viewing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of letters and words.</li> <li>The learner uses language for thinking and problem solving.</li> </ul>	Level 3 Level 5	C, P	1	1	Short Answer	M
Item 4	Reading and Viewing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of letters and words.</li> <li>The learner uses language for thinking and problem solving.</li> </ul>	Level 3 Level 5	C, P	1	1	Short Answer	E
Item 5	Reading and Viewing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of letters and words.</li> <li>The learner uses language for thinking and problem solving.</li> </ul>	Level 3 Level 5	C, P	1	1	Short Answer	M

**Question 3:****Sipho and Sarah.**

<b>Item Number:</b>	<b>Learning Outcome:</b>	<b>Assessment Standard:</b>	<b>SACMEQ Level:</b>	<b>Cognitive Category:</b>	<b>Time (in mins.)</b>	<b>Max. Score</b>	<b>Question Format:</b>	<b>Expected Difficulty:</b>
Item 1	Reading and Viewing	<ul style="list-style-type: none"><li>The learner makes meaning of written text through reading.</li></ul>	Level 1 Level 4	R	1	1	MCQ	E
Item 2	Reading and Viewing	<ul style="list-style-type: none"><li>The learner makes meaning of written text through reading.</li><li>The learner uses visual cues to make meaning.</li></ul>	Level 1 Level 4	R	1	1	MCQ	M
Item 3	Reading and Viewing	<ul style="list-style-type: none"><li>The learner makes meaning of written text through reading.</li></ul>	Level 1 Level 4	C	1	1	MCQ	M
Item 4	Reading and Viewing	<ul style="list-style-type: none"><li>The learner makes meaning of written text through reading.</li></ul>	Level 1 Level 4	R	1	1	MCQ	D
Item 5	Reading and Viewing	<ul style="list-style-type: none"><li>The learner makes meaning</li></ul>	Level 1 Level 4	R	1	1	MCQ	D

		of written text through reading.						
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**Question 4:**  
**What are they doing?**

<b>Item Number:</b>	<b>Learning Outcome:</b>	<b>Assessment Standard:</b>	<b>SACMEQ Level:</b>	<b>Cognitive Category:</b>	<b>Time (in mins.)</b>	<b>Max. Score</b>	<b>Question Format:</b>	<b>Expected Difficulty:</b>
Item 1	Reading and Viewing  Writing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> <li>The learner is able to write own sentences without a frame.</li> </ul>	Level 1 Level 3	C, R	5	2	Extended Response	D
Item 2	Reading and Viewing  Writing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> <li>The learner is able to write own sentences without a frame.</li> </ul>	Level 1 Level 3	C, R	5	2	Extended Response	D
Item 3	Reading and Viewing  Writing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> <li>The learner is able to write own sentences</li> </ul>	Level 1 Level 3	C, R	5	2	Extended Response	D

		without a frame.						
Item 4	Reading and Viewing  Writing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> <li>The learner is able to write own sentences without a frame.</li> </ul>	Level 1 Level 3	C, R	5	2	Extended Response	D
Item 5	Reading and Viewing  Writing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> <li>The learner is able to write own sentences without a frame.</li> </ul>	Level 1 Level 3	C, R	5	2	Extended Response	D

**Question 5:**

**Jackie's Story.**

Item Number:	Learning Outcome:	Topic:	SACMEQ Level:	Cognitive Category:	Time (in mins.)	Max. Score	Question Format:	Expected Difficulty:
1	Reading and Viewing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> </ul>	Level 1 Level 3	R, P	1	1	Short Answer	E
2a	Writing	<ul style="list-style-type: none"> <li>The learner is able to write individual words.</li> </ul>	Level 1 Level 3	C, R	1	1	Short Answer	M

2b	Writing	<ul style="list-style-type: none"> <li>The learner is able to write individual words.</li> </ul>	Level 1 Level 3	C, R	1	1	Short Answer	M
2c	Writing	<ul style="list-style-type: none"> <li>The learner is able to write individual words.</li> </ul>	Level 1 Level 3	C, R	1	1	Short Answer	M
2d	Writing	<ul style="list-style-type: none"> <li>The learner is able to write individual words.</li> </ul>	Level 1 Level 3	C, R	1	1	Short Answer	M
3a	Reading and Viewing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> </ul>	Level 1 Level 3	R, P	2	1	Short Answer	M
3b	Reading and Viewing	<ul style="list-style-type: none"> <li>The learner uses visual cues to make meaning.</li> </ul>	Level 1 Level 3	R, P	2	1	Short Answer	D

**Question 6:**  
**Games we like to play.**

Item Number:	Learning Outcome:	Assessment Standard:	SACMEQ Level:	Cognitive Category:	Time (in mins.)	Max. Score	Question Format:	Expected Difficulty:
1a	Writing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner writes individual words.</li> <li>The learner collects and records</li> </ul>	Level 1 Level 3 Level 5	R, P	1	1	Short Answer	M

		information in different ways.						
1b	Writing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner writes individual words.</li> <li>The learner collects and records information in different ways.</li> </ul>	Level 1 Level 3 Level 5	R, P	1	1	Short Answer	M
1c	Writing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner writes individual words.</li> <li>The learner collects and records information in different ways.</li> </ul>	Level 1 Level 3 Level 5	R, P	1	1	Short Answer	M
1d	Writing  Thinking and Reasoning	<ul style="list-style-type: none"> <li>The learner writes individual words.</li> <li>The learner collects and records information in different ways.</li> </ul>	Level 1 Level 3 Level 5	R, P	1	1	Short Answer	M

**Question 7:**  
**How often?**

<b>Item Number:</b>	<b>Learning Outcome:</b>	<b>Assessment Standard:</b>	<b>SACMEQ Level:</b>	<b>Cognitive Category:</b>	<b>Time (in mins.)</b>	<b>Max. Score</b>	<b>Question Format:</b>	<b>Expected Difficulty:</b>
a	Reading and Viewing	<ul style="list-style-type: none"><li>The learner recognizes and makes meaning of words.</li></ul>	Level 3	P	1	1	Short Answer	D
b	Reading and Viewing	<ul style="list-style-type: none"><li>The learner recognizes and makes meaning of words.</li></ul>	Level 3	P	1	1	Short Answer	D
c	Reading and Viewing	<ul style="list-style-type: none"><li>The learner recognizes and makes meaning of words.</li></ul>	Level 3	P	1	1	Short Answer	D
d	Reading and Viewing	<ul style="list-style-type: none"><li>The learner recognizes and makes meaning of words.</li></ul>	Level 3	P	1	1	Short Answer	D

e	Reading and Viewing	<ul style="list-style-type: none"> <li>The learner recognizes and makes meaning of words.</li> </ul>	Level 3	P	1	1	Short Answer	D
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**Test characteristics: Grade 3 Literacy Test After the Pilot:**

**Test Total:** 41  
**Total Number of Items:** 36  
**Question Format Ratio:** 10 MCQ: 21 Short Answer: 5 Extended Response  
 Therefore: 28% MCQs, 58% Short Answer, 14% Extended Response  
**Expected Question Difficulty Ratio:** 6E: 15M: 15D  
 Therefore: 16% Easy, 42% Medium, 42% Difficult

## APPENDIX D: GRADE 6 MATHEMATICS TEST ASSESSMENT FRAMEWORK

Knowledge/skills to be assessed for LO 1 (Tasks 1 & 2)

Knowledge/ skills		Grade 3	Grade 4	Grade 5	Grade 6	Grade 7
Ordering, comparing and representing whole numbers				1.3	2.9	
Ordering, comparing and representing fractions and decimals	Non-contextual			1.15	1.23 2.3 2.20 2.17	
	Contextual	1.10	1.9	1.27		
Place value	Non-contextual		1.4. 1.5	1.28	2.8	
Rounding off	Non-contextual				1.18	2.5
Add & subtract whole numbers	Non-contextual		1.11	1.14	1.22 2.16	
Multiply and Divide whole numbers	Non-contextual		1.17	2.4 2.6	1.19 2.18 2.10	
	Contextual	1.8	1.12 1.26			

<b>Operations with fractions, decimals and percentage</b>	<b>Non-contextual</b>			<b>1.24</b>	<b>2.12</b> <b>2.7</b> <b>2.14</b> <b>2.23</b>	<b>2.21</b> <b>2.29</b>
	<b>Contextual</b>		<b>2.11</b>	<b>1.29</b>	<b>2.27</b> <b>2.25</b>	
<b>TOTAL</b>		<b>2</b>	<b>8</b>	<b>9</b>	<b>18</b>	<b>3</b>

10 out of 40 are contextual questions (25%)

**4. Knowledge/skills to be assessed for LO2 (Tasks 1 & 2)**

*Note: Although I have indicated contextual vs non-contextual, these are not useful analytic categories for this outcome.*

<b>Knowledge/ skills</b>		<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Grade 7</b>
<b>Number patterns and input/output values</b>	<b>Non-contextual</b>	1.1	1.6	2.1 1.16	2.2	2.24
		1.2			1.21	
<b>Geometric patterns</b>	<b>Non-contextual</b>		1.13	1.30	2.15	2.30
					2.26	
<b>Equations and equivalent expressions</b>	<b>Non-contextual</b>				2.19	
					1.20	
	<b>Contextual</b>		1.7		2.22	
<b>TOTAL</b>		<b>2</b>	<b>3</b>	<b>3</b>	<b>9</b>	<b>3</b>

**5. Knowledge/skills to be assessed for LO3 (Task 3)**

*Note: Not possible to distinguish contextual vs non-contextual for this outcome.*

<b>Knowledge/ skills</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Grade 7</b>
<b>2 – D shapes</b>	3.1	3.3	3.2		3.13 3.4 3.16
<b>3-D objects</b>	3.5	3.6		3.8 3.11 3.15	
<b>Transformation/shapes within shapes</b>			3.7 3.10 3.17	3.9 3.14 3.12	
<b>Perspective and Position</b>				3.18  3.19 3.20	
<b>Total</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>3</b>

**6. Knowledge/skills to be assessed for LO4 (Task 4)**

*Note: Although I have indicated contextual vs non-contextual, these are not useful analytic categories for this outcome.*

<b>Knowledge/skills</b>		<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Grade 7</b>
<b>Time</b>	<b>Contextual</b>		<b>4.4</b>	<b>4.5</b>	<b>4.15</b> <b>4.16</b>	
<b>Mass</b>	<b>Non-contextual</b>			<b>4.9</b>		
	<b>Contextual</b>	<b>4.2</b>			<b>4.10</b> <b>4.11</b> <b>4.17</b>	
<b>Capacity</b>	<b>Non-contextual</b>				<b>4.12</b>	
	<b>Contextual</b>	<b>4.1</b>		<b>4.6</b>	<b>4.13</b> <b>4.14</b>	<b>4.20</b>
<b>Length</b>	<b>Contextual</b>		<b>4.3</b>	<b>4.7</b>	<b>4.8</b>	<b>4.18</b> <b>4.19</b>
<b>TOTAL</b>		<b>2</b>	<b>2</b>	<b>4</b>	<b>9</b>	<b>3</b>

# APPENDIX E: GRADE 6 SCIENCE ASSESSMENT FRAMEWORK

Question Number	Learning Outcome 1			Learning Outcome 2			Learning Outcome 3		
	Investigations			Constructing Sc Knowledge			Science Society Environment		
	Assessment Standards			Assessment Standards			Assessment Standards		
	<i>Plans</i>	<i>Conducts</i>	<i>Evaluates</i>	<i>Recalls</i>	<i>Category</i>	<i>Interpret</i>	<i>IKS</i>	<i>Impact</i>	<i>Bias</i>
1.1	X								
1.2		X	X						
1.3			X						
1.4			X						
1.5	X								
2.1	X								
2.2			X						
2.3			X						
2.4			X						
3.1				X					
3.2				X					
3.3				X					
4				X	X				
5.1				X		X	X		
5.2				X		X	X		
5.3						X			
6				X	X	X			
7.1						X	X	X	
7.2						X	X	X	
7.3							X	X	X



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**ERRATA:**

ERROR! BOOKMARK NOT DEFINED.

# 1. INTRODUCTION

## 1.1 Background

Congratulations!

You have been selected to assist us in furthering an intervention whose main focus is in the GATEWAY Learning Areas of Science and Technology, Mathematics and Numeracy and Literacy in South Africa. We appreciate your willingness to assist with the test administration process and value your contribution to make the Integrated Education Programme (IEP) a huge success.

This project is a ***Literacy, Numeracy and Mathematics and Science*** study for Grade 3 and Grade 6 learners in IEP schools and non-IEP control schools in 4 provinces: KZN, Limpopo, Northern Cape and Eastern Cape. More than 70 sample and control schools are part of this study. It will be your responsibility to administer different tests for Numeracy and Literacy (Grade 3) and different tests for Mathematics and Science (Grade 6).

All things being excellently done, the fieldwork is the backbone of this project. Let's go out and do this work with skill and perfection!!

## 1.2 Purpose of this manual

The purpose of this MANUAL is to assist you to administer the tests correctly and to ensure uniformity in all schools where tests are administered. This manual is only in English but you will be working with learners of different languages. In the IEP schools the languages used across the provinces is limited to: SEPEDI, ENGLISH, AFRIKAANS, TSHIVENDA, XITSONGA, ISIZULU, ISIXHOSA. You have in part been selected as a test administrator for a particular province because of your knowledge of and proficiency in languages in that province.

This manual only covers a part of the possible issues that you will be faced with, but should be sufficient to prepare you. We rely on you, therefore, to use your discretion to deal with issues not covered! Note that in all eventualities you are not to deviate from the prescribed procedures. This manual should accompany you every time you administer tests.

## 1.3 General conditions

You have been selected for your reputation in being efficient and punctual. We therefore rely on you for the following:

- ✓ To always be on time;
- ✓ To communicate to with the provincial coordinator whenever required;
- ✓ To not operate outside of your brief;
- ✓ To not accept responsibility for issues outside of your control or on behalf of JET Education Services, without the express permission of the provincial coordinator;

- ✓ To be an ambassador for JET Education Services and establish relationships that are conducive to a programme that will run over several years;
- ✓ To act and administer instruments in a professional, vigilant and consistent manner;
- ✓ To conduct the sampling process at schools in an efficient and effective manner;
- ✓ To handle all resources supplied by JET Education Services in a responsible and cost-effective manner;
- ✓ To pay meticulous attention to detail and complete all documents, log sheets provided by JET Education Services;
- ✓ To hand over all materials to the provincial coordinator after use;
- ✓ To identify areas where the process involved in the next round of testing can be improved;
- ✓ To enjoy the experience.

## 1.4 Numbers and instruments

### 1.4.1 Grade 3 Instruments (Numeracy and Literacy)

For learners who completed grade 3 in 2004, two instruments are to be administered to learners ***who are now in grade 4*** in IEP sample and non-IEP control schools.

It is recommended that the Grade 3 numeracy instrument be administered first.

After a break of ½ hour, the literacy instrument is to be administered to the same group of grade 4 learners in each tested school.

Each instrument should take 1 ½ hours for learners to complete. If learners are slow to complete the instrument, a maximum of 15 additional minutes can be allowed, so that learners complete the tests to the best of their ability and to their satisfaction. The grade 3 instruments are to be administered in the Language of Learning and Teaching (LOLT) at the school.

**The administrator of the grade 3 instruments is to note the following for the baseline study:**

Wherever possible, the entire set of instruments has been translated in the Language of Learning and Teaching (LOLT) of the IEP and non-IEP control schools. However, the numeracy instruments do not have the instruction page in any language other than English. This instruction page will require translation for the benefit of learners who are being tested in other languages other than English.

- ***If you are uncertain of how to translate the instruction page, please request the assistance of an educator at the school***

The instruction page in the literacy instrument has been translated into the Language of Learning and Teaching (LOLT) of the IEP and non-IEP control schools. However, note that in certain pictures or maps in the instrument, not all

words have been translated. Some of these words remain in English. It is advised that for the benefit of learners doing the literacy instrument in any language other than English that you translate these words for learners' benefit.

- ***If you are uncertain of how to translate these words, please request the assistance of an educator at the school.***

#### **1.4.2. Grade 6 Instruments (Mathematics and Science)**

For learners who completed grade 6 in 2004, two instruments are to be administered to learners **who are now in grade 7** in IEP sample and non-IEP control schools.

It is recommended that the Grade 6 mathematics instrument be administered first.

After a break of ½ hour, the science instrument is to be administered to the same group of grade 7 learners in each tested school.

Each instrument should take 1 ½ hours for learners to complete. If learners are slow to complete the instrument, a maximum of 15 additional minutes can be allowed, so that learners complete the tests to the best of their ability and to their satisfaction.

The grade 6 instruments are to be administered in the Language of Learning and Teaching (LOLT) at the school. In most instances - at most IEP and non-IEP control schools in the study - the Language of Learning and Teaching in grade 6 and 7 is English. However, a few schools in the sample IEP and non-IEP control schools are using Afrikaans at this level.

**The administrator of the grade 6 instruments is to note the following for the baseline study:**

Wherever possible, the entire set of instruments has been translated into the Language of Learning and Teaching (LOLT) of the IEP and non-IEP control schools. However, the grade 6 mathematics instruments do not have the instruction page at the beginning of the instrument in any language other than English. This instruction page will require translation for the benefit of learners who are being tested in Afrikaans.

- ***If you are uncertain of how to translate these words from English into Afrikaans, please request the assistance of an educator at the school***

Likewise, in the grade 6 science instrument there may be certain pictures or labels in the instrument which do not have all words translated from the English. If you are administering the Afrikaans version of the grade 6 science instrument, it is advised that for the benefit of learners doing the test, you translate these words.

- ***If you are uncertain of how to translate these words from English into Afrikaans, please request the assistance of an educator at the school.***

## **2. PREPARATION TO ADMINISTER THE TESTS**

### **2.1 Preparation before going to sample IEP and non-IEP Control Schools**

As an administrator appointed by JET Education Services for the purpose of the effective and efficient delivery of the baseline study in the IEP, your most important duty before going to schools is to prepare effectively by studying this manual properly. Spending time reviewing this manual will ensure that you are a champion at administering the tests copyrighted to JET Education Services.

We have contacted all the sample IEP and non-IEP control schools and have confirmed your visit. Letters have been sent to school principals giving instructions for necessary preparations at schools. In our letter, the principal was asked to:

- Have a venue prepared with sufficient individual desks/tables; and
- Assign a teacher (or teachers) to work with yourselves, the fieldworkers/test administrators, to organise the learners, assist with the sampling process and any translations which are needed in the LOLT at the school, if test administrators are unfamiliar with this language.

You are also to be supplied in the training session with an officially signed letter from the Department of Education (DoE) which requests that schools cooperate with you to ensure that the test administration process at their school goes smoothly.

From your provincial coordinator, you will receive a schedule of test administration visits for your province and directions to schools, wherever possible. Your work at schools is to begin at 08:00 am in the morning. This timing is to ensure that there is sufficient time to introduce yourselves to the school principal, and then, with the assistance of educators at the school, to sample learners for the testing process. The sampling process should take roughly half an hour, from 08:30-09:00. Learners are then to be seated such that learner testing can begin promptly at 9:00 am.

Grade 4 learners doing the Grade 3 instruments are to be tested in one classroom at the school, while Grade 7 learners doing the Grade 6 instruments are to be tested in another. We have sought to ensure that learners, inasmuch as possible, write under conditions conducive for performance, by ensuring in advance that schools do have classrooms for learners.

Given the need to sample learners randomly, before testing, it is, therefore, crucial that you are at schools each morning during the testing period (which is approximately 2 weeks in most participating IEP provinces) at least 1 hour before testing commences.

**The following material will be supplied to administrators for each school:**

- Enough copies of each of the learner tests (plus a few spare!) for each grade.

Remember that the sample size for testing is 25 learners, therefore, 2 spare copies of instruments will be supplied for use in the event of a printing error, for example.

The material will be ready and packed for you by the JET Education Services provincial coordinator for your province. Each administrator is responsible for all materials placed in his/her possession. At the end of the test administration period, all completed and uncompleted instruments are to be returned to the JET Education Services provincial coordinator who will either courier all materials back to Gauteng or will drive back to Gauteng transporting all the materials for data capture and analysis.

**In the event that a test administrator has any queries, the following contact persons for these queries are as follows:**

- ☞ Questions related to the fieldwork: **Deborah Hunt**, IEP project manager for JET Education Services, **Cell: 082 393 5688**.
- ☞ Questions related to the tests/instruments: **Dr Jackie Moyana**, JET Education Services Evaluation and Research Divisional Manager, **Cell: 082 697 5494**.
- ☞ Questions related to KZN: Moses Simelane, Provincial Coordinator for KZN, **Cell: +27834342457**.
- ☞ Questions related to Northern Cape: Deborah Hunt, Provincial Coordinator for NC, **Cell: 082 393 5688**.
- ☞ Questions related to Eastern Cape: Xolisa Vitsha (XV) or Carla Pereira (CP), Provincial Coordinators for EC, **Cell (XV): +27734811876 Cell (CP): +27835878908**.
- ☞ Questions related to Limpopo: Dr Jackie Moyana, Provincial Coordinator for Limpopo, **Cell: 082 697 5494**.
- ☞ Questions related to logistical arrangements: Deborah Hunt, **Cell: 082 393 5688**.

## **2.2 Preparation when arriving at the schools**

Make sure you arrive at the school at least thirty (30) minutes before your scheduled time. Check in with the principal or the contact person at the school on arrival.

Ask for the teacher who is to assist you and go over the arrangements for the day together. Arrangements will include the testing schedule, the venue/classrooms for learner testing (one grade per classroom), the sampling process, preventing any possible interruptions, wherever possible at the school, and the signing-off procedure, after the test administration process has been satisfactorily completed.

We have planned to test 25 learners per grade at a sample IEP or non-IEP control school (see Table on page 10 for totals per school).

### **2.2.1 The SAMPLING Process: Instructions on How to Sample Learners Effectively**

**Please note: Before you begin the sampling process, any learners who are repeating the grade MUST be excluded.**

Where there are **more** than the required number of learners per grade, you have to draw a sample of learners to participate in this study. Depending on the number of learners at a school and the number of learners that are to be assessed in the study from every sample IEP and non-IEP control school, you will use the “sampling technique”:

**Example 1:**

**25 Learners to be assessed and a total of 96 learners in the grade with 41 boys and 56 girls (no repeaters).**

**Step 1:** Before sampling, ask the teacher that is assisting you at the school to gather all the learners in that specific grade. Line the learners up, with boys and girls in different blocks/lines.

**Step 2:** Getting the numbers of boys 'right'.

**A. Determining the number of BOYS needed for the sample you have to draw:**

- Divide the total number of boys in the grade (41 in this instance) by the total number of learners in the grade (96). This equals 0.42. *This number needs to be rounded off to the nearest integer.* This equals to **0.4**. Multiply the number of learners to be assessed (25 for every grade in the study) by 0.4 which equals 10. **This means 10 boys have to be drawn from the grade.**

**A.**

$$\text{Total Number of Boys for the Sample} = \frac{\text{Total Number of Boys in the Grade}}{\text{Total Number of Learners in the Grade}}$$

(Answer above: -----) x 25 (i.e., the Total Number of Learners to be Tested)

$$= \text{TOTAL Number of Boys for the Sample:}$$

-----

**B. To randomly sample the BOYS who will write the tests:**

- Divide 41 (i.e., the total number of Boys in the grade) by 10 (i.e., the ANSWER to STEP A. above). The answer is 4.1. This number must be rounded off to 5 - the nearest higher integer. This means every fifth boy must be selected. Therefore, select boys 1, 6, 11, 16, etc. At the end of the list/line, continue by starting again at the beginning of a new list/line. Do this until you have selected 10 boys from the total number of boys in the grade at the school, excluding repeaters.

**B.**

$$\text{Interval for Selecting Boys for the Sample} = \frac{\text{Total Number of Boys in the Grade}}{\text{(Answer of Step A. above)}}$$

Answer is therefore: -----) (**Note: Answer is to be rounded off to nearest higher integer**)

**Step 3:** Getting the numbers of girls `right`.

**A. Determining the number of GIRLS needed for the sample you have to draw:**

- Divide the total number of GIRLS in the grade (56 in this instance) by the total number of learners in the grade (96 in this example). This equals 0.58. *This number needs to be rounded off to the nearest integer.* This equals to **0.6**. Multiply the number of learners to be assessed (25 for each grade tested in the study) by 0.6 which equals 15. **This means 15 girls have to be drawn from the grade.**

**A.**

**Total Number of GIRLS for the Sample = Total Number of GIRLS in the Grade -----**  
 \_\_\_\_\_  
**Total Number of Learners in the Grade -----**

**(Answer above: -----) x 25 (i.e., the Total Number of Learners to be Tested)**

**= TOTAL Number of GIRLS for the Sample**  
 \_\_\_\_\_

**BEFORE CONTINUING, CHECK TOTAL NUMBER OF LEARNERS SELECTED FOR TESTING**

**= 25**

**10 boys + 15 girls = 25 learners to be tested ✓**

**B. To randomly sample the GIRLS who will write the tests:**

- Divide 56 (*i.e., the total number of Girls in the grade*) by 15 (*i.e., the ANSWER to STEP A. above*). The answer is 3.7. This number must be rounded off to 4 - the nearest higher integer. This means every fourth girl must be selected. Select girls 1, 5, 9, 13, 17, etc. At the end of the list/line continue by starting again at the beginning of a new list/line. *Do this until you have selected 15 girls from the total number of girls in the grade at the school, excluding repeaters.*

**B.**

**Interval for Selecting Girls for the Sample = Total Number of Girls in the Grade -----**  
 \_\_\_\_\_  
**(Answer of Step A. above) -----**

**Answer is therefore: -----) (Note: Answer is to be rounded off to nearest higher integer)**

**= Answer rounded off: -----**

**Example 2:**

**25 Learners to be assessed and 186 learners in the grade with 101 boys and 85 girls (no repeaters).**

**Step 1:** Before sampling, ask the teacher that is assisting you at the school to gather all the learners in that specific grade. Line the learners up, with boys and girls in different blocks/lines.

**Step 2:** Getting the numbers of boys 'right'.

**A. Determining the number of BOYS needed for the sample you have to draw:**

- Divide the total number of boys in the grade (101 in this instance) by the total number of learners in the grade (186). This equals 0.54. *This number needs to be rounded off to the nearest integer.* This equals to **0.5**. Multiply the number of learners to be assessed (25 for every grade in the study) by 0.5 which equals 12.5. Round off to result to the nearest integer, which is 13 in this instance. **This means 13 boys have to be drawn from the grade.**

**A.**

$$\begin{aligned} \text{Total Number of Boys for the Sample} &= \frac{\text{Total Number of Boys in the Grade}}{\text{Total Number of Learners in the Grade}} \\ & \text{(Answer above: } \text{-----)} \times 25 \text{ (i.e., the Total Number of Learners to be Tested)} \\ &= \text{TOTAL Number of Boys for the Sample (round off to nearest integer)} \\ & \text{-----} \end{aligned}$$

**B. To randomly sample the BOYS who will write the tests:**

Divide 101 (i.e., the total number of Boys in the grade) by 13 (i.e., the ANSWER to STEP A. above). The answer is 7.8. This number must be rounded off to 8 - the nearest higher integer. This means every eighth boy must be selected. Therefore, select boys 1, 9, 17, 25, 33 etc. At the end of the list/line, continue by starting again at the beginning of a new list/line. Do this until you have selected 13 boys from the total number of boys in the grade at the school, excluding repeaters

**B.**

$$\begin{aligned} \text{Interval for Selecting Boys for the Sample} &= \frac{\text{Total Number of Boys in the Grade}}{\text{(Answer of Step A. above)}} \\ \text{Answer is therefore: } & \text{-----) (Note: Answer is to be rounded off to nearest higher integer)} \\ &= \text{Answer rounded off: } \text{-----} \end{aligned}$$

**Step 3:** Getting the numbers of girls 'right'.

**A. Determining the number of GIRLS needed for the sample you have to draw:**

- Divide the total number of GIRLS in the grade (85 in this instance) by the total number of learners in the grade (186 in this example). This equals 0.45. *This number needs to be rounded off to the nearest integer.* This equals to **0.5**. Multiply the number of learners to be assessed (25 for each grade tested in the study) by 0.5 which equals 12.5. **This means 13 girls have to be drawn from the grade, when the result is rounded off.**

**A.**

$$\begin{aligned} \text{Total Number of GIRLS for the Sample} &= \frac{\text{Total Number of GIRLS in the Grade -----}}{\text{Total Number of Learners in the Grade -----}} \\ & (\text{Answer above: -----}) \times 25 \text{ (i.e., the Total Number of Learners to be Tested)} \\ & = \text{TOTAL Number of GIRLS for the Sample} \\ & \text{-----} \end{aligned}$$

**BEFORE CONTINUING, CHECK TOTAL NUMBER OF LEARNERS SELECTED FOR TESTING**

$$= 25$$

**13 boys (SEE ABOVE) + 13 girls = 26 learners to be tested X**

The calculations show that the total number of learners to be tested is 26 and **NOT 25 as needed**. Therefore, when faced by a situation such as this, minus 26 (i.e., the result you now have) from 25 (i.e., the number of learners you require for the sample) = -1. The result tells you how many learners should be taken out of the possible sample group of girls and boys.

Therefore, one learner needs to be taken out of the possible sample group selected for testing. Because there are more boys than girls in this instance, remove 1 girl (i.e., remove one learner from the group of learners with the fewest numbers in relation to the other group) such that there are 12 girls and not 13.

**BEFORE CONTINUING, CHECK THE RESULT AGAINST THE TOTAL NUMBER OF LEARNERS REQUIRED FOR TESTING**

$$= 25$$

**13 boys (SEE ABOVE) + 12 girls = 25 learners to be tested ✓**

**B. To randomly sample the GIRLS who will write the tests:**

- Divide 85 (i.e., the total number of Girls in the grade) by 12 (i.e., the ANSWER to STEP A. above, **after you have done the check**). The answer is 7.1. This number must be rounded off to 8 - the nearest higher integer. This means every eighth girl must be selected. Select girls 1, 9, 17, 25, 33, etc. At the end of the list/line, continue by starting again at the beginning of a new list/line. *Do this until you have selected 12 girls from the total number of girls in the grade at the school, excluding repeaters.*

**B.**

Interval for Selecting Girls for the Sample = Total Number of Girls in the Grade -----  

 (Answer of Step A. above, after check) -----

Answer is therefore: -----) (**Note: Answer is to be rounded off to nearest higher integer**)  
 = Answer rounded off: -----

**What to do? (Learner numbers are low):**

**NOTE:** If there are **few** learners in each grade (i.e., 25 learners or less for the grade you are testing at the school), use **all** the learners in the grade for testing.

**What to do? (Learner numbers are just over 25):**

**NOTE:** If there are **just over** 25 learners in each grade (i.e., 26 - 32 learners, for example, in the grade you are testing at the school), use **all** the learners in the grade for testing (or test as many learners as you can, *given the number of instruments provided to you for a particular school*).

The following table indicates how many learners are to be tested for each instrument, PER SCHOOL:

INSTRUMENT	CLASSROOM 1 (Grade 4 learners)	CLASSROOM 2 (Grade 7 learners)	TOTAL
<b>Numeracy Grade 3</b>	<b>25</b>	/	<b>25</b>
<b>Literacy Grade 3</b>			
<b>Maths Grade 6</b>	/	<b>25</b>	<b>25</b>
<b>Science Grade 6</b>			

We cannot, unfortunately, accommodate more per class as we are restricted in terms of the number of instruments printed per school. As a rule of thumb, two extra tests per learning area for a grade are provided, should there be a need for spare copies.

## 2.3 Preparation after testing at the schools

As a test administrator contracted by JET Education Services, there are a number of forms which you must diligently complete as per your contract and to the satisfaction of JET Education Services, before payment for services rendered will be processed.

See these forms at the back of this manual. Your provincial coordinator in the training session for test administrators in your province will go over these forms and ensure that requirements are fully understood.

While these forms require that you record details of the testing experience at each school, as well as all details that relate to travel and expenditure, the full and detailed completion of these forms will ensure that you receive prompt payment from JET Education Services on the submission of an invoice and proof of purchases (i.e., all receipts for expenditure, including petrol, toll gates, etc).

To remain organised throughout the test administration process, you may want to keep all your original receipts in a well-marked envelope for this purpose. You will not be reimbursed for expenses, if receipts have been lost.

## 3. GENERAL INSTRUCTIONS FOR INVIGILATING

### 3.1 Introduction

All the instructions **printed in bold and italics** must be read to the learners. These instructions must be strictly adhered to. Only test administrators, who are familiar with these instructions and attended the training, may administer the tests at sample IEP and non-IEP schools in the study.

### 3.2 Venue

Check the venue/classroom where learners will be writing the instruments that you are to administer. The (class/)room should be large enough to allow for adequate seating arrangements to be organised.

Learners should be seated in such a way in the testing room that they cannot copy from or disturb one another.

Interruptions, inside and outside the testing room, should be kept to a minimum.

Learners who are not involved in the testing process should be instructed to keep away from the room. If possible, ask the principal at the school to assist with ensuring that learners who are not selected for testing, but are in the same grades being tested, are kept occupied by their teachers.

Make sure that the venue is properly ventilated.

Ensure that you know where toilets are located, in relation to the testing venue.

## 3.2 Material required

### 3.2.1 By the test administrator/ fieldworker

- ✓ This manual (consider it your `bible' for the test administration period);
- ✓ The appropriate test instruments for the grade that you will be responsible for;
- ✓ A watch (or a cell phone with clock/timing/organiser function);
- ✓ 1 pencil sharpener to have on hand for learners if their pencils break;
- ✓ 1 eraser;
- ✓ At least 2 spare pencils for learners who don't have their own (don't forget to collect these back from learners, after each test has been administered);
- ✓ 1 calculator (or a cell phone with a calculator function);
- ✓ Any forms that are to be completed after test administration (e.g., during breaks or after testing sessions have been completed – at home or at your accommodation venue, in the afternoon, for example).

### 3.2.2 By each learner

- ✓ The appropriate test instrument (1 booklet per learner)
- ✓ Pencil

**(Note:** the Grade 6 Science instrument indicates in the instructions that learners may use a pen. However, it is recommended that you encourage learners, from the onset, to use pencils, as they can erase any mistakes they have made more easily).

## 3.3 Time management

Time management when conducting the JET instruments is absolutely crucial. Two (2) sessions, per grade tested, are required per school. 90 minutes are allocated for each session. There should be a 30 minute break between sessions.

Please ensure that all preparations, the handing out of material, the verbal explanation of instructions and the completion of the instruments are all steps which are completed within the allotted time. While invigilating, you can remind learners of the amount of time they have left to complete a particular test (e.g. 30 minutes, 15 minutes).

Test Numeracy first with Grade 4 learners. At the same time, the Grade 6 Mathematics test with Grade 7 learners will start in a nearby classroom at the school.

The next session, after break (or after Grade 4 learners have been fed through the school's feeding scheme), will be used for the Grade 3 Literacy test with Grade 4 learners and the Grade 6 Science tests with Grade 7 learners.

A team of two fieldworkers will go to a school. One fieldworker should be the designated administrator for the Grade 4 learners and the other for the Grade 7 learners.

If only one fieldworker goes to a school, then ask one teacher to assist you to administer the tests across the different grades. In the first classroom/testing room,

you will read/translate the instructions for learners, hand out the tests and let the learners start the test. The assisting teacher will oversee what learners are doing, while you go to the other classroom to start those learners off.

Remember to tell the assisting teacher not to give out to learners any information/answers/explanations that could help them answer test questions.

In instances where teachers are called on to assist with invigilation, it should be made clear to these educators that they are to assist you to carry out the procedures outlined by JET Education Services.

After an invigilation session, ensure that educators do not retain any copies of the JET instruments. An important part of effectively carrying out the test administration process is to ensure that the contents of the JET instruments remain confidential.

## 4. ADMINISTERING THE INSTRUMENT

### 4.1 General

Most learners will not be familiar with “external interference” in their school day. You, therefore, have to act as natural as possible to make them feel `at home’. Act in a friendly and confident manner to assure learners of your good intentions. Letting learners sing a song before testing could help to put them at ease.

Note that the instructions of this manual, as they relate to the instruments that you are to administer, are to be read clearly and slowly.

During the invigilation process, you should move among the learners to ensure that they follow the instructions correctly and do not copy from each other.

Where applicable, write an example of a multiple-choice question on the chalk board, so that learners understand how to answer this type of question.

### 4.2 Introducing the procedure

Get all the learners to sit in their places for the test administration process. Then say:

- 🗨️ ***You are going to do a test. Try your best and work as quickly and as carefully as possible.***
- 🗨️ ***Answer all the questions in the test booklet that I will give to you. Answer ALL the questions in the test booklet.***
- 🗨️ ***Sometimes you have to choose one answer by chalk a circle around the right answer. (Show this on the chalk board - prepare an example question in advance for this purpose.) Remember, there is only one correct answer to each multiple choice question.***
- 🗨️ ***In some questions, you have to write some words, sentences or numbers to answer the question.***

- 🗨️ ***If you are not sure about the answer, skip the question and come back to it later, if you have time.***
- 🗨️ ***Do you all understand what to do? Are there any questions?***

#### 4.3 Handing out of the test booklets

Say:

- 🗨️ ***I am now going to hand out the tests. YOU MAY NOT OPEN THE TEST BOOKS OR WRITE ANYTHING UNTIL YOU ARE TOLD TO DO SO.***

Hand out a test booklet to each learner.

#### 4.4 Completing of learner's particulars on the booklet

Say:

- 🗨️ ***We are going to fill in some information on the front page*** (show the front page to them).

Please go slowly through this section with the learners. Walk among them to ensure that this is done correctly.

Say:

- 🗨️ ***Please write down your school's name where it says 'School name'.***
- 🗨️ ***Write down your name and surname next to 'Learner name'.***
- 🗨️ ***Write down your gender. Are you a boy or a girl? Boys write 'BOY' and girls write 'GIRL'.***
- 🗨️ ***How old are you? Write down your age in years.***
- 🗨️ ***If you need any help, put up your hand and I will come to you.***
- 🗨️ ***DO NOT TURN THE PAGE UNTIL YOUR ARE TOLD TO DO SO!***

Check to ensure that ALL the learners have correctly completed the front page.

#### 4.5 Writing the test

Say (for Numeracy/Mathematics test):

- 🗨️ ***You will have enough time to write the test: 90 minutes. Turn the page to the first question*** (show the page you are referring to).
- 🗨️ ***First read the question. Then, answer the questions carefully. HERE is an example to show you how to answer multiple choice questions.***
- 🗨️ ***I will show you how to answer a multiple choice question.***

E.G.  $1 + 2 = \dots\dots\dots$

**What is 1 + 2?**

A. 7

**B.** 3

C. 4

D. 12

💡 **The right answer is 'Three'. Draw a circle around the letter B next to the number 'three'.**

💡 **Do you understand?**

💡 **You can use blank space in the instrument to work out your answers.**

💡 **Ignore the empty boxes on the far right of the page, these are for markers.**

💡 **Are you ready? Answer all the questions up to the last question. Begin and Good luck!** (Note the time).

Say (for Literacy test):

💡 **First read the passage. Then, answer the questions which follow. HERE is an example to show you how to answer multiple choice questions.**

💡 **I will show you how to answer a multiple choice question.**

E.G. The ball is red.

**What colour is the ball?**

A. Blue

**B.** Red

C. Green

D. Yellow

💡 **The right answer is 'Red'. Draw a circle around the letter B next to 'red'.**

💡 **Do you understand?**

💡 **You will have enough time to write the test: 90 minutes. Turn the page to the first question** (show the page you are referring to).

💡 **Ignore the empty boxes on the far right of the page, these are for markers.**

💡 **Are you ready? Answer all the questions up to the last question. Begin and Good Luck!** (Note the time).

Say (for Science test):

EG. What kind of animal is an elephant?  
(Tick  **ONE box**)

<input checked="" type="checkbox"/>	Mammal
<input type="checkbox"/>	Reptile
<input type="checkbox"/>	Bird

- 🗨️ **You will have enough time to write the test: 90 minutes. Turn the page to the first question** (show the page you are referring to).
- 🗨️ **Follow the instructions carefully.**
- 🗨️ **To answer some questions correctly, you are asked to TICK your answer in the box that shows the right answer** (on the chalk board, mark a tick in a box so that this way of answering is clear to learners. You can also refer learners to an example in the test where this kind of response is shown).
- 🗨️ **To answer other questions, you are asked to write a response in a sentence.**
- 🗨️ **Do you understand?**
- 🗨️ **Ignore the empty boxes on the far right of the page, these are for markers**
- 🗨️ **Are you ready? Answer all the questions up to the last question. Begin and Good Luck!** (Note the time).

If a learner raises his/her hand, go to him/her without disturbing the rest of the learners and find out what the problem is. **YOU MAY NOT (AND NEITHER MAY A TEACHER WHO IS ASSISTING YOU) HELP HIM/HER TO ANSWER THE QUESTIONS!!!**

Make sure that the learners are answering the questions in the correct way and in the right place.

**After about 90% of the learners have completed the test (or when the time is up), say:**

- 🗨️ **Please stop the test now.** (This is not a speed test, but it should not be allowed to drag on for longer than 90 minutes. Most learners should have finished the test in the allocated time. On the fieldwork form, please note the time when +- 22 – 23 (90 %) of the learners have finished the test you are administering. **NOTE:** You can allow a maximum of 15 minutes overtime, if most learners have not finished the test in the allotted time).

If some learners finish before the others, ask them to check their answers carefully and to sit quietly until other learners have completed the instruments.

At the end of the allocated time for the test (90 minutes), collect the test booklets. Count them and make sure that you have collected all the booklets. Bind each set together. Put the test material back into the box that you brought the instruments in.

All the testing material **MUST** be returned to JET Education Services, without exception. **NO TESTING MATERIAL SHOULD BE GIVEN TO ANYBODY EVEN IF THEY ASK!**

Thank the learners for their cooperation; thank the teacher(s) at the school for his/her(/their) assistance and move on to the next session.

**POINTS TO REMEMBER:**

- Remember to collect all instruments back (completed and uncompleted).
- Complete all forms/ log sheets provided by JET Education Services
- BE a shining ambassador on behalf of JET Education Services subcontracted to RTI for the IEP.
- Notify your Provincial Coordinator of any difficulties encountered at any schools on your Test Administrator schedule.
- Be responsible and ensure that learners have written instruments under the best of all possible conditions at their school.
- Enjoy the process!

**Good luck and thank you!**

## APPENDIX G: SUPPORTING TABLES

**Table (a):** Comparison of overall test mean between project and control schools on the Numeracy test

Group	Mean %	N	Std. deviation
Project	26.0	1279	16.22019
Control	23.6	204	15.84948

**Table (b):** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Numeracy test

IEP cohort	Mean %	N	Std. deviation
Better Performing	31.1	95	16.57966
Poor Performing	25.4	906	15.67532
First Time	26.3	278	17.54182

**Table (c):** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by province and district) on the Numeracy test

Province	District	Mean %	N	Std. deviation
Eastern Cape	Cofimvaba	29.9	39	14.27929
	Engcobo	29.0	25	17.19637
	King Williams Town	29.8	25	20.08427
	Lady Frere	34.6	66	17.65923
	Queenstown	36.2	79	18.18634
	Sterkspruit	21.5	75	13.44701
	<b>Total</b>		<b>30.4</b>	<b>309</b>
KwaZulu Natal	Nkandla	25.0	248	13.03192
	Eshowe	30.9	36	16.11312
	<b>Total</b>	<b>25.8</b>	<b>284</b>	<b>13.56943</b>
Limpopo	Vhembe I	18.2	112	11.38151
	Vhembe II	22.1	125	11.45408
	Bohlabela	29.0	63	18.49419
	Capricorn	24.5	71	14.41082
	Greater Sekhukhune	35.2	73	20.97368
	Mopani/Waterberg	22.6	125	15.41512
	<b>Total</b>	<b>24.2</b>	<b>529</b>	<b>15.85015</b>
Northern Cape	Frances Baard	22.9	92	17.39873
	Pixley Ka Sema	28.2	25	21.61657
	<b>Total</b>	<b>24.1</b>	<b>117</b>	<b>18.41065</b>

**Table (d):** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Numeracy test

IEP cohort		Counting	Addition	Subtraction	Multiplication	Division
Better Performing	Mean %	30.6	37.8	30.7	32.6	17.1
	N	95	95	95	95	95
	Std. deviation	16.920	22.102	22.630	19.619	14.212
Poor Performing	Mean %	28.6	31.4	25.0	23.8	10.7
	N	906	906	906	906	906
	Std. deviation	17.899	20.537	19.066	18.902	12.607
First Time	Mean %	29.5	32.2	25.6	24.8	12.0
	N	278	278	278	278	278
	Std. deviation	17.845	21.682	22.026	21.679	14.827

**Table (e):** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by province) on the Numeracy test

Province		Counting	Addition	Subtraction	Multiplication	Division
Eastern Cape	Mean %	30.7	37.5	28.8	30.2	18.5
	N	309	309	309	309	309
	Std. deviation	17.904	21.547	21.446	21.380	15.606
KwaZulu Natal	Mean %	27.4	30.8	26.0	28.4	9.4
	N	284	284	284	284	284
	Std. deviation	16.107	18.333	17.560	16.645	9.722
Limpopo	Mean %	28.9	29.8	24.5	20.5	8.8
	N	569	569	569	569	569
	Std. deviation	18.275	20.772	19.750	18.799	11.686
Northern Cape	Mean %	27.7	31.3	20.9	21.5	11.2
	N	117	117	117	117	117
	Std. deviation	18.989	23.763	22.251	21.200	15.397

**Table (f):** Comparison of overall test mean between project and control schools on the Literacy test

Group	Mean %	N	Std. deviation
Project	42.0	1289	21.02475
Control	46.2	204	20.84481

**Table (g):** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Literacy test

IEP cohort	Mean %	N	Std. deviation
Better Performing	43.2	95	16.27327
Poor Performing	41.5	915	21.17691
First Time	43.1	279	22.02253
Total	42.0	1289	21.04275

**Table (h):** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by province) on the Literacy test

Province	Mean %	N	Std. deviation
Eastern Cape	47.7	310	21.71132
KwaZulu Natal	40.1	285	20.54185
Limpopo	39.4	568	20.99802
Northern Cape	43.8	126	17.71924
Total	42.0	1289	21.04275

**Table (i):** Overall mean percentage for Grade 4 learners in project schools (as disaggregated by district) on the Literacy test

Province	District	Mean %	N	Std. deviation
Eastern Cape	Cofimvaba	50.6	39	19.83251
	Engcobo	53.9	25	20.91750
	King Williams Town	36.1	25	21.84319
	Lady Frere	46.4	66	22.77874
	Queenstown	50.4	79	17.74747
	Sterkspruit	46.5	76	24.49239
	<b>Total</b>	<b>47.7</b>	<b>310</b>	<b>21.71132</b>
KwaZulu Natal	Nkandla	41.2	249	20.00015
	Eshowe	32.5	36	22.82699
	<b>Total</b>	<b>40.1</b>	<b>285</b>	<b>20.54185</b>
Limpopo	Vhembe I	33.7	112	18.72332
	Vhembe II	43.9	100	18.45475
	Bohlabela	44.5	63	20.02095
	Capricorn	54.7	71	24.90313
	Greater Sekhukhune	26.2	72	12.85052
	Mopani/Waterberg	38.2	100	19.98123
	<b>Total</b>	<b>39.4</b>	<b>518</b>	<b>21.10118</b>
Northern Cape	Frances Baard	40.2	101	15.68312
	Pixley Ka Sema	58.4	25	18.26997
	<b>Total</b>	<b>43.8</b>	<b>126</b>	<b>17.71924</b>

**Table (j):** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by IEP cohort classification) on the Literacy test

IEP cohort		Reading Viewing	Thinking Reasoning	Writing
Better Performing	Mean %	56.7	51.7	57.5
	N	95	95	95
	Std. deviation	20.748	21.730	31.213
Poor Performing	Mean %	52.9	50.4	49.9
	N	915	915	915
	Std. deviation	26.636	25.173	39.382
First Time	Mean %	54.9	51.3	54.4
	N	279	279	279
	Std. deviation	27.111	26.272	39.073

**Table (k):** Overall mean percentage per skill for Grade 4 learners in project schools (as disaggregated by province) on the Literacy test

Province		Reading Viewing	Thinking Reasoning	Writing
Eastern Cape	Mean %	60.3	53.8	59.9
	N	310	310	310
	Std. deviation	26.512	26.046	40.392
KwaZulu Natal	Mean %	53.1	47.6	48.87
	N	285	285	285
	Std. deviation	26.351	25.603	36.046
Limpopo	Mean %	49.1	50.3	47.2
	N	568	568	568
	Std. deviation	26.280	25.479	39.007
Northern Cape	Mean %	57.9	51.9	56.0
	N	126	126	126
	Std. deviation	22.354	19.159	36.754

**Table (l):** Comparison of overall test mean between project and control schools on the Mathematics test

Group	Mean %	N	Std. deviation
Project schools	23.0	1283	10.774
Control schools	24.3	225	12.662

**Table (m):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by IEP cohort classification) on the Mathematics test

IEP cohort	Mean %	N	Std. deviation
Better Performing	25.6	100	10.927
Poor Performing	23.4	934	11.035
First Time	20.4	249	9.161
Total	22.9	1258	10.832

**Table (n):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by province) on the Mathematics test

Province	Mean %	N	Std. deviation
Eastern Cape	20.9	308	8.714
KwaZulu Natal	21.2	304	9.600
Limpopo	24.9	551	11.813
Northern Cape	24.3	120	11.756

**Table (o):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by district) on the Mathematics test

Province	District	Mean %	N	Std. deviation
Eastern Cape	Cofimvaba	18.6	37	06.646
	Engcobo	22.5	25	04.283
	King Williams Town	23.8	15	04.552
	Lady Frere	21.9	75	08.477
	Queenstown	25.4	81	07.589
	Sterkspruit	15.1	75	09.306
	<b>Total</b>	<b>20.9</b>	<b>308</b>	<b>08.714</b>
KwaZulu Natal	Nkandla	21.6	257	09.891
	Eshowe	19.0	47	07.517
	<b>Total</b>	<b>21.2</b>	<b>304</b>	<b>09.600</b>
Limpopo	Vhembe I	34.6	124	13.373
	Vhembe II	19.3	104	07.200
	Bohlabela	27.2	58	09.136
	Capricorn	19.5	74	08.744
	Greater Sekhukhune	18.1	70	08.215
	Mopani/Waterberg	25.6	121	10.698
	<b>Total</b>	<b>24.9</b>	<b>551</b>	<b>12.014</b>
Northern Cape	Frances Baard	24.3	120	11.756
	<b>Total</b>	<b>24.3</b>	<b>120</b>	<b>11.756</b>

**Table (p):** Overall mean percentage for Grade 7 learners in project schools for LO1 skills on the Mathematics test

Group	Statistics	Ordering Whole Numbers	Ordering Fractions	Place Value	Rounding Off	Adding & Subtracting Whole Numbers	Multiplying & Dividing Whole Numbers	Operations with Fractions, Decimals & Percentage
Project	Mean %	38.2	19.2	29.4	3.8	26.0	23.4	15.7
	N	1283	1283	1283	1283	1283	1283	1283
	Std. deviation	36.692	18.441	26.145	14.352	22.950	24.390	13.493

**Table (q):** Overall mean percentage for Grade 7 learners in project schools for LO2 skills on the Mathematics test

Group	Statistics	Number Patterns	Geometric Patterns	Equations
Project	Mean %	40.2	25.9	25.3
	N	1283	1283	1283
	Std. deviation	18.721	21.862	21.533

**Table (r):** Overall mean percentage for Grade 7 learners in project schools for LO3 skills on the Mathematics test

Group		2-D shapes	3-D shapes	Transformation	Perspective
Project	Mean %	27.1	14.3	15.7	24.2
	N	1283	1283	1283	1283
	Std. deviation	22.994	16.392	15.725	29.769

**Table (s):** Overall mean percentage for Grade 7 learners in project schools for LO4 skills on the Mathematics test

Group	Statistics	Time	Mass	Capacity	Length
Project	Mean %	23.1	16.0	12.9	23.9
	N	1283	1283	1283	1283
	Std. deviation	23.912	19.551	15.801	24.979

**Table (t):** Comparison of overall test mean between project and control schools on the Science test

Group	Mean %	N	Std. deviation
Project	25.5	1288	15.65993
Control	25.9	224	17.93443

**Table (u):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by IEP cohort classification) on the Science test

IEP cohort	Mean %	N	Std. deviation
Better Performing	29.2	100	14.42388
Poor Performing	25.9	940	16.33809
First Time	22.5	248	12.82428
Total	25.5	1288	15.65993

**Table (v):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by province) on the Science test

Province	Mean %	N	Std. deviation
Eastern Cape	24.6	307	13.60082
KwaZulu Natal	24.0	302	15.04252
Limpopo	26.6	556	16.98669
Northern Cape	26.2	123	15.43942

**Table (w):** Overall mean percentage for Grade 7 learners in project schools (as disaggregated by district) on the Science test

Province	District	Mean %	N	Std. deviation
Eastern Cape	Cofimvaba	30.0	37	11.30388
	Engcobo	22.0	25	7.39119
	King Williams Town	18.9	15	4.48395
	Lady Frere	19.5	74	9.29284
	Queenstown	33.7	81	15.64360
	Sterkspruit	19.2	75	12.69997
	<b>Total</b>	<b>24.6</b>	<b>307</b>	<b>13.60082</b>
KwaZulu Natal	Nkandla	25.8	255	15.05376
	Eshowe	14.3	47	10.74327
	<b>Total</b>	<b>24.0</b>	<b>302</b>	<b>15.04252</b>
Limpopo	Vhembe I	38.0	99	11.78040
	Vhembe II	29.3	104	10.71731
	Bohlabela	38.4	58	9.28676
	Capricorn	29.6	74	13.83698
	Greater Sekhukhune	11.3	70	9.45015
	Mopani/Waterberg	18.4	151	20.10273
	<b>Total</b>	<b>26.6</b>	<b>556</b>	<b>16.98669</b>
Northern Cape	Frances Baard	23.9	97	15.02837
	Pixley Ka Sema	34.7	26	14.11612
	<b>Total</b>	<b>26.2</b>	<b>123</b>	<b>15.43942</b>

**Table (x):** Comparison of overall test mean of project schools (as disaggregated by IEP cohort classification) on each of the three LOs for Science

IEP cohort	Statistics	LO1	LO2	LO3
Better performing	Mean %	29.4	30.9	12.5
	N	100	100	100
	Std. deviation	21.169	15.521	15.590
Poor performing	Mean %	28.0	26.4	13.4
	N	940	940	940
	Std. deviation	22.527	17.910	17.253
First time	Mean %	21.9	23.9	8.9
	N	248	248	248
	Std. deviation	21.409	15.853	11.064

**Table (y):** Comparison of overall test mean of project schools (as disaggregated by province) on each of the three LOs for Science

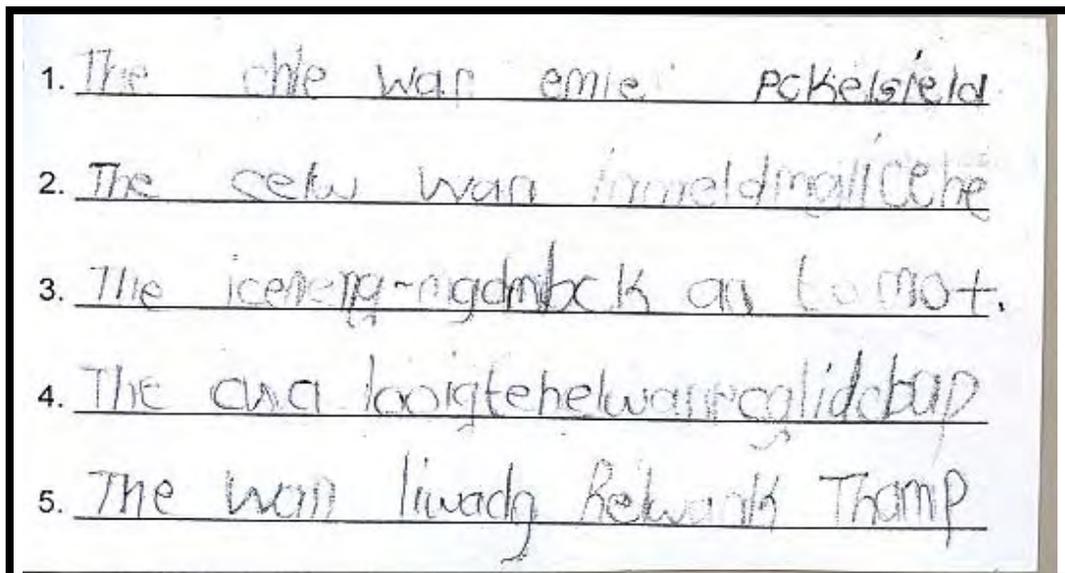
<b>Province</b>	<b>Statistics</b>	<b>LO1</b>	<b>LO2</b>	<b>LO3</b>
Eastern Cape	Mean %	24.0	26.4	10.7
	N	307	307	307
	Std. deviation	21.661	15.981	13.477
KwaZulu Natal	Mean %	29.4	22.4	9.3
	N	302	302	302
	Std. deviation	22.706	14.759	12.549
Limpopo	Mean %	26.5	28.5	16.2
	N	556	556	556
	Std. deviation	21.342	19.664	19.553
Northern Cape	Mean %	30.2	25.3	7.7
	N	123	123	123
	Std. deviation	26.348	14.348	8.242

## APPENDIX H: SCANNED EXAMPLES OF HOW LEARNERS WRITE SENTENCES

### GRADE 3 LITERACY

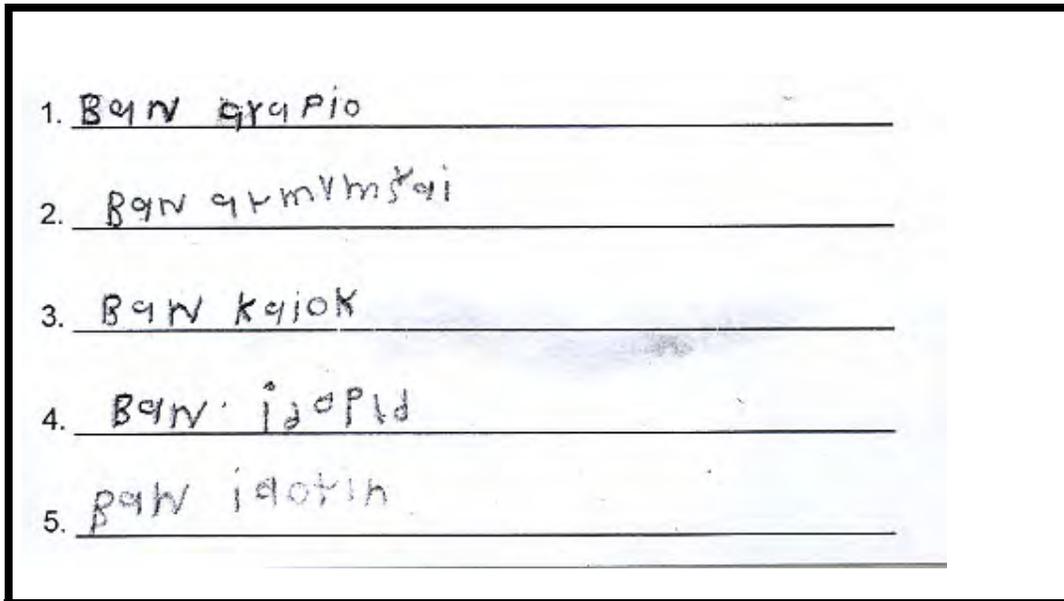
The scanned example was taken from a Grade 4 learner in Northern Cape. The school's LOLT was English and therefore the English version of the test was administered to learners in this school (F/4/1/03). This question required learners to write five sentences to describe what they saw in the picture provided. As can be seen, the learner was not able to competently write a sentence. Scorers were instructed that if too much inference about what the learner is trying to say was needed, then no marks should be awarded. For instance, we are able to make out (phonetically) from the scanned example that the learner was trying to say "The children" at the start of sentence 1 and 2 but the rest of the sentence was difficult to decipher.

#### Example 1:



Example 2 comes from a Sepedi speaking learner in Limpopo. Again, one is clearly able to see that this learner struggled to competently write a sentence, even in the home language.

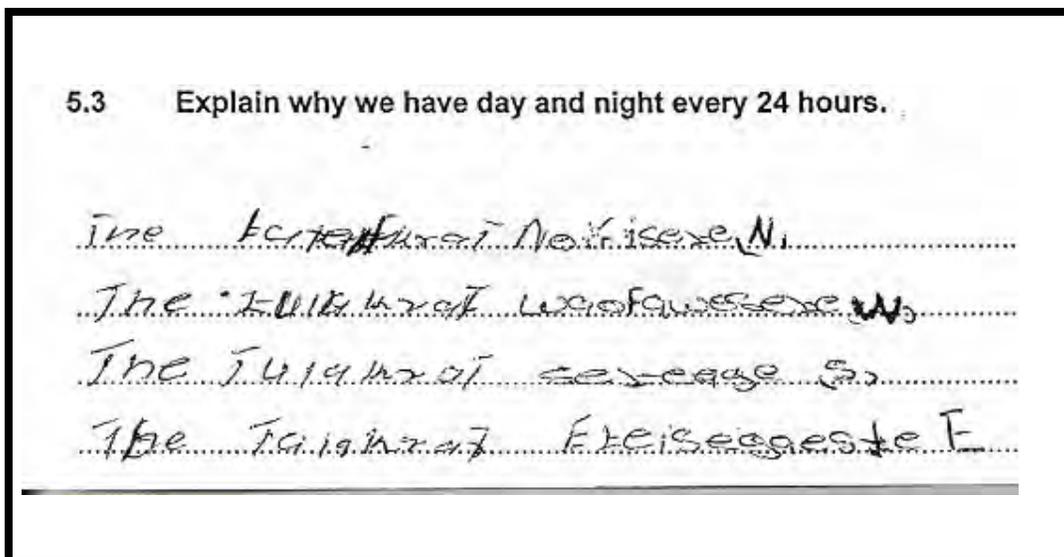
**Example 2:**



**GRADE 6 SCIENCE**

The science test was administered to all Grade 7 learners in English. As no literacy test was administered to learners in this grade, the science test can provide an indication of the levels of reading and writing abilities learners have. Example 3 is taken from a female learner in Limpopo (P/3/4/13). Again, one is able to clearly see that even at the senior phase, some learners are still not able to competently write sentences. The example below shows that this particular learner (age 15) is mixing two languages: English and Sepedi and cannot write a proper sentence in English.

**Example 3:**



Example 4 is an excerpt from a 13-year-old male learner. The example below shows that this learner is more or less able to write sentences in English but did not have the knowledge (or perhaps vocabulary) to answer the question.

**Example 4:**



# APPENDIX J: PERFORMANCE MONITORING PLAN (PMP)

## A. Performance Indicator Table 1 (long version)

<b>Overarching Performance Indicator:</b>  Improved student performance in numeracy, literacy, mathematics and science for students in participating schools.		2004*	2005	2006	2007
	<b>Cohort 1 Target</b>	Baseline (B): = **	(a) Gr. 3: B + 2% = ** (b) Gr. 6: B + 2% = **	(a) Gr. 3: B + 5% = ** (b) Gr. 6: B + 5% = **	(a) Gr. 3: B + 8% = ** (b) Gr. 6: B + 8% = **
	<b>Cohort 1 Actual</b>		(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **
	<b>Cohort 2 Target</b>	Baseline: = **	(a) Gr. 3: B + 4% = ** (b) Gr. 6: B + 4% = **	(a) Gr. 3: B + 7% = ** (b) Gr. 6: B + 7% = **	(a) Gr. 3: B + 10% = ** (b) Gr. 6: B + 10% = **
	<b>Cohort 2 Actual</b>		(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **
	<b>Cohort 3 Target</b>	Baseline: = **	(a) Gr. 3: B + 2% = ** (b) Gr. 6: B + 2% = **	(a) Gr. 3: B + 5% = ** (b) Gr. 6: B + 5% = **	(a) Gr. 3: B + 8% = ** (b) Gr. 6: B + 8% = **
	<b>Cohort 3 Actual</b>		(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **	(a) Gr. 3: = ** (b) Gr. 6: = **
	<b>Cohort 4 Target</b>	---	---	Baseline:	(a) Gr. 3: B + 2% (b) Gr. 6: B + 2%
	<b>Cohort 4 Actual</b>	---	----		(a) Gr. 3: (b) Gr. 6:

**B. (Short version) Performance Indicator Table**

<b>Overarching Performance Indicator:</b>  Improved student performance in grades 3 and 6 in participating schools  <i>In relation to all Cohorts tested</i>		2004*	2005	2006	2007
	<b>Grade 3 Target</b>	Baseline (B): = **	B + 2% = **	B + 5% = **	B+ 8% = **
	<b>Grade 3 Actual</b>		= **	= **	= **
	<b>Grade 6 Target</b>	Baseline (B): = **	B + 2% = **	B + 5% = **	B + 8% = **
	<b>Grade 6 Actual</b>		= **	= **	= **

(In the short version, all figures are reduced to two figures a Grade 3 (overall) baseline result and a Grade 6 (overall) baseline result.

The baseline for each grade is then used to predict the target improvements in the consecutive years of the project – ‘B’ = baseline