

INTEGRATED EDUCATION PROGRAMME

FOLLOW-UP STUDY 1: RESULTS MEASUREMENT OF GRADES 3 AND 6 LEARNERS IN IEP SCHOOLS

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS

ACRONYMS AND ABBREVIATIONS

EXECUTIVE SUMMARY

CHAPTER 1: BACKGROUND TO THE FOLLOW-UP STUDY

- 1.1 BACKGROUND TO THE INTEGRATED EDUCATION PROGRAMME (IEP)
- 1.2 PURPOSE OF THIS REPORT
- 1.3 RESEARCH QUESTIONS

CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY

- 2.1 RESEARCH DESIGN
- 2.2 LIMITATIONS OF THE STUDY
- 2.3 SAMPLE
- 2.4 ADMINISTRATION OF THE LEARNER TESTS
 - 2.4.1 Grade 3 instruments (Numeracy and Literacy)
 - 2.4.2 Grade 6 instruments (Mathematics and Science)
- 2.5 FIELDWORKERS
- 2.6 QUALITY ASSURANCE AND MONITORING OF FIELDWORK
- 2.7 SCORING, DATA CAPTURE AND ANALYSIS
 - 2.7.1 Scoring
 - 2.7.2 Data capture and analysis

CHAPTER 3: LEARNER PERFORMANCE RESULTS

- 3.1. INTRODUCTION
- 3.2 COMPARISON OF PERFORMANCE OF PROJECT AND CONTROL SCHOOLS
 - 3.2.1 Comparison across the four Learning Areas
 - 3.2.2 Grade level of difficulty
 - 3.2.2.1 *Numeracy*
 - 3.2.2.2 *Mathematics*
- 3.3 PERFORMANCE OF PROJECT SCHOOLS ONLY
 - 3.3.1 IEP cohort
 - 3.3.2 Province
 - 3.3.2.1 *Grade 3 Numeracy*
 - 3.3.2.2 *Grade 3 Literacy*
 - 3.3.2.3 *Grade 6 Mathematics*
 - 3.3.2.4 *Grade 6 Science*
 - 3.3.3 Gender
 - 3.3.4 Learning Area knowledge/skill domains
 - 3.3.4.1 *Grade 3 Numeracy*
 - 3.3.4.2 *Grade 3 Literacy*
 - 3.3.4.3 *Grade 6 Mathematics*
 - 3.3.4.4 *Grade 6 Science*

CHAPTER 4: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Tables

Table 1:	Summary of different measurement points in the assessment of learner performance
Table 2:	Comparison of the total number of schools tested in the baseline and follow-up studies
Table 3:	Comparison of the total number of learners tested in the baseline and follow-up studies per instrument
Table 4:	Comparison of the total number of learners tested in the baseline and follow-up studies per gender
Table 5:	Age distribution of Grades 3 and 6 learners tested in the follow-up study
Table 6:	Comparison of performance across Numeracy, Literacy, Mathematics and Science
Table 7:	Item distribution per grade (difficulty level) and task on the Grade 3 Numeracy test
Table 8:	Comparison of the number of Grade 3 learners achieving 50% or more (per group) at each level, on the Numeracy test
Table 9:	Item distribution per grade (difficulty level) and task on the Grade 6 Mathematics test
Table 10:	Comparison of the number of Grade 6 learners achieving 50% or more (per group) at each level, on the Mathematics test
Table 11:	Comparison of mean performances across IEP cohorts on the Numeracy test
Table 12:	Comparison of mean performances across IEP cohorts on the Literacy test
Table 13:	Comparison of mean performances across IEP cohorts on the Mathematics test
Table 14:	Comparison of mean performances across IEP cohorts on the Science test
Table 15:	Comparison of mean performances across provinces on the Numeracy test
Table 16:	Comparison of mean performances across provinces on the Literacy test
Table 17:	Comparison of mean performances across provinces on the Mathematics test
Table 18:	Comparison of mean performances across provinces on the Science test
Table 19:	Comparison of performances across Numeracy, Literacy, Mathematics and Science, as disaggregated by gender
Table 20:	Item distribution per skill on the Grade 3 Numeracy test
Table 21:	Comparison of mean scores across the Numeracy skills
Table 22:	Comparison of mean scores across the contextual and non-contextual items on the Numeracy test
Table 23:	Comparison of overall test means between baseline and follow-up results on each of the seven questions in the Literacy test
Table 24:	Comparison of mean scores across each of the Grade 6 Mathematics LOs
Table 25:	Comparison of the overall mean percentages for Grade 6 learners in project schools for LO1 skills on the Mathematics test, between baseline and follow-up studies
Table 26:	Comparison of the overall mean percentages for Grade 6 learners in project schools for LO2 skills on the Mathematics test, between baseline and follow-up studies
Table 27:	Comparison of the overall mean percentages for Grade 6 learners in project schools for LO3 skills on the Mathematics test, between baseline and follow-up studies
Table 28:	Comparison of the overall mean percentages for Grade 6 learners in project schools for LO4 skills on the Mathematics test, between baseline and follow-up studies
Table 29:	Comparison of overall test means between baseline and follow-up results on each of the three LOs for Science
Table 30:	Description of questions in the Grade 6 Science test
Table 31:	Comparison of overall test means between baseline and follow-up study results on each of the seven questions in the Science test

Figures

- Graph 1: Comparison of the number of Grade 3 learners in project schools achieving 50% or more (per group) at each level, on the Numeracy test
- Graph 2: Comparison of the number of Grade 6 learners in project schools achieving 50% or more (per group) at each level, on the Mathematics test
- Graph 3: Comparison of overall mean by IEP cohort – Numeracy
- Graph 4: Comparison of overall mean by IEP cohort – Literacy
- Graph 5: Comparison of overall mean by IEP cohort – Mathematics
- Graph 6: Comparison of overall mean by IEP cohort – Science
- Graph 7: Comparison of overall mean by province – Numeracy
- Graph 8: Comparison of overall mean by province – Literacy
- Graph 9: Comparison of overall mean by province – Mathematics
- Graph 10: Comparison of overall mean by province – Science
- Graph 11: Comparison of baseline and follow-up mean scores by LO

Appendices

- Appendix A: IEP Results, Indicators & Targets
- Appendix B: Test Administration Manual
- Appendix C: Data Analysis Framework
- Appendix D: Item Analysis of the Literacy Test
- Appendix E: Item Analysis of the Science Test
- Appendix F: School Reports

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We would also like to thank the US Agency for International Development (USAID) for funding the study.

ACRONYMS AND ABBREVIATIONS

2-D	Two dimensional
3-D	Three dimensional
AIDS	Acquired Immunodeficiency Syndrome
BICS	Basic Interpersonal Communicative Skills
BP	Better Performing
CALP	Cognitive Academic Language Proficiency
DDSP	District Development Support Programme
DO	District Official
DoE	Department of Education
EC	Eastern Cape [province]
FT	First Time [New Primaries]
HIV	Human Immunodeficiency Virus
IEA	International Association for the Evaluation of Educational Achievement
IEP	Integrated Education Programme
JET	JET Education Services
KZN	KwaZulu-Natal [province]
L2	Second Language Learner
LA	Learning Area
LEP	Limited English Proficient [learner]
LO	Learning Outcome
LOLT	Language of Learning and Teaching
LP	Limpopo [province]
Max	Maximum
MCQ	Multiple Choice Question
Min	Minimum
NC	Northern Cape [province]
NCS	National Curriculum Statement
No.	Number
PIRLS	Progress in International Reading Literacy Study
PED	Provincial Education Department
PP	Poor Performing
RTI	Research Triangle Institute
SGB	School Governing Body
SMT	School Management Team
SPSS	Statistical Package for the Social Sciences
Std	Standard
USAID	United States Agency for International Development
vs	Versus

EXECUTIVE SUMMARY

To determine the extent to which the IEP intervention has made an impact on the teaching and learning of Literacy and Numeracy at the Grade 3 level and Mathematics and Science at the Grade 6 level in IEP schools since the baseline study, JET was appointed to use its tests to measure the performance of Grades 3 and 6 learners in Literacy, Numeracy/Mathematics and Science in a sample of IEP (i.e. 'project') and non-IEP (i.e. 'control') schools as part of the follow-up study for 2005, 2006 and 2007.

In the baseline study, the project schools that were tested were drawn by means of a stratified random sample from the total of 637 project schools. The stratification was based on the IEP categories of schools, namely Poor Performing (PP) or cohort 1, Better Performing (BP) or cohort 2, and the first group of First Time New Primaries (FT) or cohort 3.¹ In total, 57 schools were tested; this 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 constitutes 1.3% of the total IEP schools.

For the follow-up study, the same schools as had been randomly selected to participate in the baseline study were once again tested. The only difference was in Limpopo province. In August 2005, the Limpopo Education Department decided to disengage IEP from working with teachers and schools in IEP cohorts 1-3 due to a dispute over the payment of incentives. Most of the project schools in Limpopo were therefore withdrawn from the IEP and as a result were not tested in the follow-up study. Only the four sampled and baselined project schools in the Bohlabela district and one control school in the Sekhukhune district were tested in the follow-up round. This meant that only 43 (37 project and 6 control) schools were tested in the follow-up study – as opposed to the 66 tested in the baseline study.

As with the baseline study, a sample of 25 learners was drawn from each of the target grades (grade 3 and 6) 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 overall comparison of results of the follow-up learner testing, which was conducted in October 2005, with those attained by Grades 4 and 7² learners in the baseline study is summarised below.

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

² Due to a delay in the testing programme, for the baseline it was decided to test Grades 4 and 7 learners. This was done on the assumption 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 (as indeed was the case with the 2005 follow-up testing) will, therefore, compare the baseline results with those of Grades 3 and 6 learners at the end of the year.

Performance indicator by group

Learning Area	Group	Baseline Result	Follow-up result	% point³	% over baseline⁴
Grade 3 Numeracy	Project	26%	23%	-3%	-12%
	Control	24%	20%	-4%	-17%
Grade 3 Literacy	Project	42%	40%	-2%	-5%
	Control	46%	37%	-9%	-20%
Grade 6 Mathematics	Project	22%	22%	+0.4%	+2%
	Control	23%	20%	-3%	-13%
Grade 6 Science	Project	25.5%	25.3%	-0.2%	-1%
	Control	25.9%	25.5%	-0.4%	-1.5%

Both the baseline findings and the follow-up findings show that most Grade 3 and 6 learners continue to perform below the 30% mark, with the exception of literacy.

The IEP target for the end of year 2 (2005) was to achieve a 2% improvement over the baseline phase. The target set for project schools has not been met in all LAs except for Grade 6 Mathematics. However, in terms of percentage point difference, control schools experienced bigger drops than project schools.

In terms of level of difficulty, the results show that at the Grade 3 level, learners are performing two grades below expected levels in Numeracy. In other words, many more learners were able to correctly answer Grade 1 level items than they were Grade 3 level items. In fact, only 4% of learners in the sample were able to achieve means of 50% or more on the Numeracy test. This is a 0.8% drop since the baseline study. This is worrying because the majority of Grade 3 learners are not coping sufficiently with Grade 3 material.

At the Grade 6 level, almost all learners could not achieve means of 50% or more on Grade 6 level items. Most learners are performing three to four levels below expected curriculum levels.

The results also show that girls continue to outperform boys in all LAs, especially in Literacy.

Performance indicator by gender

Learning Area	Group	Baseline Result	Follow-up result	% point	% over baseline
Grade 3 Numeracy	Female	26%	23%	-3%	-12%
	Male	25%	22%	-3%	-12%
Grade 3 Literacy	Female	43%	44%	+1%	+2%
	Male	42%	38%	-4%	-10%
Grade 6 Mathematics	Female	22%	23%	+1%	5%
	Male	22%	21%	-0.5%	-2%
Grade 6 Science	Female	25.7%	25.5%	-0.2%	-1%
	Male	25.3%	25.1%	-0.2%	-1%

At a global level, these overall results are worrying, and similar strengths and weaknesses identified in the baseline are evident in the follow-up study.

³ This is the actual difference in mean scores between baseline and the follow-up studies.

⁴ This is the % improvement or drop rate over the baseline study.

- **Numeracy:** Counting and addition continue to be the main strengths for Grade 3 learners, while division continues to be the greatest challenge. Contextual type questions were experienced as more difficult than non-contextual or straight arithmetic type questions.
- **Literacy:** Questions that required learners to search and retrieve explicitly stated information from the text showed higher means than questions that required interpretations and evaluations to be made. Generally, learners did not cope very well with questions where the literary genre was not in narrative form (i.e. tables, cartoons, graphs, etc).
- **Mathematics:** As with the baseline study, learners did the best on LO2 type items but struggled with LO4 items, where the means were generally around the 25% mark. In terms of LO1 items, learners continue to struggle with multiplication and division, fractions, and rounding off. For LO2, learners continue to perform the best in number patterns, but struggle with geometric patterns and simple equations. In LO3, transformation was experienced as the greatest challenge. For LO4, measurement (especially mass, capacity and length) is still a problem for learners. Again, learners did better on contextual type questions than on non-contextual items.
- **Science:** Learners continue to do the best on questions relating to permanent and temporary changes but struggled with questions relating to the solar system and natural Sciences.

On the whole, for the follow-up study mean scores were lower than for the baseline study. A possible contributing factor to why IEP did not meet most of its targets in the first round of results measurement (Follow up Study 1) may be related to the way the baseline was conducted. As discussed in previous reporting, the IEP baseline testing of grade 3 and 6 learners was originally scheduled to take place in September/October 2004. However, due to a call by the newly appointed Minister of Education to align all privately administered learner tests with the national DoE Systemic Evaluation tests, learner testing could not be conducted until February/March 2005 with the tests to be used revised during the September to February period. As learners were only just a month and half into the school year by February/March 2005, grade 4 and 7 learners were tested to simulate grade 3 and 6 learners at the end of the previous school year. This choice was problematic for a number of reasons. Firstly, by February/March 2005, grade 4 and 7 learners had had approximately two and a half extra months of schooling, including the push for learning that occurs in November of each school year. Secondly, it excluded any grade 3 or, particularly, grade 6 learners who were kept back. These learners would have been included if the testing had occurred as originally planned and presumably they would have brought the averages down. Lastly, the interval between the February/March 2005 and October/November 2005 testing periods was only seven months, while the targets set for IEP were meant to reflect a year's worth of intervention activities.

Another possible explanation is that this is a new cohort of learners and their aptitude is lower than that of the learners selected for testing in the baseline study. Also, inadequate Literacy levels, whether at the general level or at the subject specific level, may have contributed to the poor performance, especially in Science and Mathematics. It may also be possible that the cascading model is not working

effectively (that master teachers are not effectively transferring knowledge to their cascadees).⁵

Nevertheless, the results generally show that IEP learners are doing better than their control counterparts, which shows that the IEP is having a positive, albeit slight, effect in project schools. Also worth noting, IEP seems to be having a positive impact on Grade 6 mathematics as the 2% target was reached in the follow up study.

However, it is clear from the results discussed in this report that IEP subcontractors need to address more effectively the weaknesses identified in each of the LAs.

⁵ It is hoped that this can be verified through the classroom observations of both master teachers and cascaded teachers, which will be done in April 2006.

1. BACKGROUND TO THE FOLLOW-UP STUDY

1.1 BACKGROUND TO THE INTEGRATED EDUCATION PROGRAMME (IEP)

The Integrated Education Programme (IEP) is an ongoing basic education programme of USAID-South Africa. IEP is a follow-on project to the District Development Support Programme (DDSP). The DDSP provided support to basic education programmes in teacher education, curriculum development and school management and governance, in selected districts in four provinces from 1998-2003. It aimed to achieve improved quality of primary education. This goal remains unchanged under the IEP and hence, in its design and structure, the emphasis on learner achievement and systemic improvement.

The goal of the programme is “improved student performance in Numeracy, Literacy, Mathematics and Science for students in participating schools”. The achievement of the following key objectives will enable USAID-South Africa to attain the specific results of the IEP, most of which focus on improving the system's capacity to deliver quality Mathematics and Science programmes.

The main objectives of the programme are:

- Enhanced capacity of teachers (targeted to the teaching of Literacy, Numeracy, Mathematics and Science);
- Effective implementation of the National Curriculum Statement (NCS) with a focus on teaching of Literacy, Numeracy, Mathematics and Science curriculum;
- Improved educational management and enhanced school governance;
- Integration of HIV and AIDS issues into curricula and teaching;
- Increased number of Mathematics and Science teachers trained through pre-service programmes; and
- Support to the national and provincial Departments of Education.

The stated goal and objectives have been discussed with the national Department of Education (DoE) and the four target Provincial Education Departments (PEDs): Eastern Cape Education Department, KwaZulu-Natal Education Department, Limpopo Education Department, and Northern Cape Education Department. The goal and objectives are consistent with South African government priorities.

To achieve these objectives, the programme goal and its **nine results**, as listed below, must be achieved over the life of the project.

- Result 1:** Increased subject matter knowledge for teachers in the targeted subject areas;
- Result 2:** Improved ability of teachers to develop and apply continuous assessment strategies and techniques;
- Result 3:** Increased number of teachers being trained (in-service) and new teachers trained (pre-service);
- Result 4:** Increased number of teachers that are teaching Literacy, Numeracy, Mathematics and Science in a manner consistent with the NCS;
- Result 5:** Improved teachers' ability to develop and use classroom materials that support Curriculum 2005 learner-centred instruction;

- Result 6:** Improved instructional leadership skills for School Management Teams (SMTs);
- Result 7:** Improved management and administrative capacity of schools to collaborate with School Governing Bodies (SGBs) and communities to develop and effectively implement School Development Plans to improve school functionality;
- Result 8:** Improved district capacity to develop and effectively implement a strategic plan for school support; and
- Result 9:** Support to the national DoE.

In late 2004, the IEP designed and set benchmark targets, which are intended to be achieved over the life of the project. The benchmark targets were subsequently revised in December 2005.⁶ RTI-IEP and subcontractors will be judged on whether the benchmark targets are attained.

1.2 PURPOSE OF THIS REPORT

The performance of learners in the baseline⁷ study, which was conducted by JET Education Services (JET) in March 2005, provided a starting point for monitoring and evaluating progress towards achieving the overall project goal: “improved student performance in Numeracy, Literacy, Mathematics and Science for students in participating schools”.

To determine the extent to which the IEP intervention has made an impact on the teaching and learning of Literacy and Numeracy at the Grade 3 level and Mathematics and Science at the Grade 6 level in IEP schools since the baseline study, JET was appointed to use its tests to measure the performance of Grades 3 and 6 learners in Literacy, Numeracy/Mathematics and Science in a sample of IEP (i.e. ‘project’) and non-IEP (i.e. ‘control’) schools as part of the follow-up study for 2005, 2006 and 2007. The research design and methodology is discussed in more detail in section 2 of this report.

This report discusses the results of the follow-up learner testing, which was conducted in October 2005, and compares these results to those attained by Grades 4 and 7⁸ learners in the baseline study.

1.3 RESEARCH QUESTIONS

The follow-up study of 2005 was guided by the following questions:

1. How has the overall performance level of Grade 3 learners in project and control schools in Numeracy and Literacy changed since the baseline study? If changes are observed, are these statistically significant?

⁶ Generally, the benchmark targets serve to set minimum improvement targets for IEP in years 2, 3 and 4 against all IEP results. Refer to Appendix A.

⁷ The final baseline report (prepared by JET) was submitted to RTI in July 2005.

⁸ Due to a delay in the testing programme, for the baseline it was decided to test Grades 4 and 7 learners. This was done on the assumption 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 (as indeed was the case with the 2005 follow-up testing) will, therefore, compare the baseline results with those of Grades 3 and 6 learners at the end of the year.

2. How has the overall performance level of Grade 6 learners in project and control schools in Mathematics and Science changed since the baseline study? If changes are observed, are these statistically significant?
3. At what grade level are learners in project schools performing?
4. How are female learners performing relative to male learners in the different Learning Areas (LAs)?
5. How have learners' performances in Learning Outcomes (LOs) and skills for the respective LAs changed since the baseline study? If changes are observed, are these statistically significant?

2. RESEARCH DESIGN AND METHODOLOGY

2.1 RESEARCH DESIGN

In order to ascertain whether or not and to what extent there have been any improvements of Grade 3 learners in Numeracy and Literacy, and Grade 6 learners in Mathematics and Science, learner performance testing was conducted using learner tests developed by JET. The tests administered to learners for the follow-up study were the same tests administered to Grades 4 and 7 learners in the baseline study.

The basic design of the learner performance Testing Periods is elaborated in the table below.

Table 1: Summary of different measurement points in the assessment of learner performance

2005 Baseline	2005 Results measurement (follow-up study 1)	2006 Results measurement (follow-up study 2)	2007 Results measurement (follow-up study 3)
<p>Measure 1:</p> <p>Random sample of 25 Grade 4 learners in Numeracy and Literacy in a sample of project schools and control schools</p>	<p>Measure 3:</p> <p>Random sample of 25 Grade 3 learners in Numeracy and Literacy in a sample of project schools and control schools</p>	<p>Measure 5:</p> <p>Random sample of 25 Grade 3 learners in Numeracy and Literacy in a sample of project schools and control schools</p>	<p>Measure 7:</p> <p>Random sample of 25 Grade 3 learners in Numeracy and Literacy in a sample of project schools and control schools</p>
<p>Measure 2:</p> <p>Random sample of 25 Grade 7 learners in Mathematics and Science in a sample of project schools and control schools</p>	<p>Measure 4:</p> <p>Random sample of 25 Grade 6 learners in Mathematics and Science in a sample of project schools and control schools</p>	<p>Measure 6:</p> <p>Random sample of 25 Grade 6 learners in Mathematics and Science in a sample of project schools and control schools</p>	<p>Measure 8:</p> <p>Random sample of 25 Grade 6 learners in Mathematics and Science in a sample of project schools and control schools</p>

Using this design, it will be possible to:

- Determine to what extent learners master content over the course of a year;
- Compare learner performance between project and control schools; and
- Compare performance of project schools across provinces, IEP cohorts, gender and LA skills.

2.2 LIMITATIONS OF THE STUDY

Although the results of these follow-up studies will provide information to determine whether there has been any change in learner performance over the life of the project, a number of limitations need to be put up front. These include the following considerations.

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. As a result, it was decided to test a random sample of Grades 4 and 7 learners in March 2005. This was done on the assumption 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. However, the period of time that elapsed between the baseline study and the current follow-up study was less than 12 months – a very short period for the IEP to influence the teaching and learning of Literacy, Numeracy, Mathematics and Science.

Additionally, the different samples of learners tested (Grades 4 and 7 learners in their third month of the academic year in the baseline study, and Grades 3 and 6 learners in their tenth month in the current follow-up study) should be taken into account, as this represents a difference of approximately four months in learning (and the possible inclusion of Grade 3 learners who would have repeated in the follow-up study, but obviously no such learners in the baseline study). More significant changes are expected in the 2006 and 2007 follow-up studies.

Furthermore, as with the baseline study, it is not possible to generalise the findings to all schools in the respective provinces and/or districts, since the sample size is not big enough to be representative of schools in the provinces and/or districts. Generalisation can only be made to project schools in the province.

There was also a reduction in sample size since the baseline. This is because of Limpopo schools in most of the districts in this province pulled out of the project (see section 2.3 for discussion).

JET in the conceptual planning phase for the study was not made aware of the importance of differentiating learners taught by Master Teachers and by cascadees. This meant that in the random sampling techniques used, there is no bias in this regard and the analysis cannot further disaggregate the results to report on this differentiation. Subsequent studies will however take this into account.

Constraints specific to the instruments themselves include:

- The Science test for Grade 6 learners does not have technology related questions. This will be addressed before subsequent testing in September 2006 and 2007 is conducted.
- According to policy and information provided to JET prior to going into the schools, the Language of Teaching and Learning (LOLT) was English in all schools, with the exception of schools in Northern Cape, for Grade 6.

However, data analysis of completed instruments shows that some learners responded in their home language and not necessarily the language in which the test was administered. This suggests that the usage of English beyond Foundation Phase may be delayed in practice and that this implications for learners' competency levels in the language.

2.3 SAMPLE

In the baseline study, the project schools that were tested were drawn by means of a stratified random sample from the total of 637 project schools. The stratification was based on the IEP categories of schools, namely Poor Performing (PP) or cohort 1, Better Performing (BP) or cohort 2, and the first group of First Time New Primaries (FT) or cohort 3.⁹ In total, 57 schools were tested; this 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 constitutes 1.3% of the total IEP schools.

For the follow-up study, the same schools as had been randomly selected to participate in the baseline study were once again tested. The only difference was in Limpopo province. In August 2005, the Limpopo Education Department decided to disengage IEP from working with teachers and schools in IEP cohorts 1-3 due to a dispute over the payment of incentives. Most of the project schools in Limpopo were therefore withdrawn from the IEP and as a result were not tested in the follow-up study. Only the four sampled and baselined project schools in the Bohlabela district and one control school in the Sekhukhune district were tested in the follow-up round. This meant that only 43 (37 project and six control) schools were tested in the follow-up study – as opposed to the 66 tested in the baseline study.

The table below provides a detailed breakdown of the sample per province.

Table 2: Comparison of the total number of schools tested in the baseline and follow-up studies

Province	Total number of sample IEP schools for the baseline study	Total number of sample IEP schools for the follow-up study	Total number of control schools for the baseline study	Total number of control schools for the follow-up study
Eastern Cape	14	14	2	2
KwaZulu-Natal	13	13	2	2
Limpopo	24	4	4	1
Northern Cape	6 ¹⁰	6	1	1
Total	57	37	9¹¹	6

⁹ That is, those schools that were not previously part of the DDSP but were invited to participate in the IEP project.

¹⁰ In the population list given to JET for Northern Cape, both of the two BP 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.

¹¹ This was calculated by multiplying the total number of project schools in each province by 1.3%. Thus 1.3% of 160 in Eastern Cape equalled 2.08; 1.3% of 152 in KZN equalled 1.98; 1.3% of 281 in Limpopo equalled 3; and 1.3% 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 LP and one in NC).

As with the baseline study, 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 3: Comparison of the total number of learners tested in the baseline and follow-up studies per instrument

Learning Area	Testing Period	Total number of learners: project school	Total number of learners: control school	Total number of learners
Grade 3 Numeracy	Baseline	1279	204	1483
	Follow-up	824	151	975
Grade 3 Literacy	Baseline	1289	204	1493
	Follow-up	824	151	975
Grade 6 Mathematics	Baseline	1283	225	1508
	Follow-up	806	141	947
Grade 6 Science	Baseline	1288	224	1512
	Follow-up	809	141	950

The distribution of learners per gender, as reflected in table 4 below, shows that there is more or less equal distribution of learners across the genders. In some cases learners did not report their gender.¹² For Grade 3 Literacy and Grade 6 Mathematics, there seems to be an inverse proportion of girls to boys between the baseline and the follow-up (e.g. for the Grade 3 Literacy baseline, girls made up 62% of the sample while in the follow-up the number dropped to 41%). This can probably be attributed to the proportion of girls to boys in the grade in which they were tested. Thus, the selection of learners for testing (sampling) was done such that the number of boys and girls chosen for a grade in a school was representative of the total number of boys and girls in the grade (refer to test administration manual for procedure and formulae); in other words, there was proportional spread.

Table 4: Comparison of the total number of learners tested in the baseline and follow-up studies per gender

Learning Area	Testing Period	Grade 3 Numeracy	Grade 3 Literacy	Grade 6 Mathematics	Grade 6 Science
Girls	Baseline	655 (52%)	672 (62%)	656 (61%)	651 (51%)
	Follow-up	403 (50%)	411 (41%)	381 (38%)	384 (48%)
Boys	Baseline	601 (48%)	406 (38%)	423 (39%)	633 (49%)
	Follow-up	403 (50%)	594 (59%)	622 (62%)	421 (52%)

In terms of age distribution, at the Grade 3 level the majority of learners were aged 8 to 11 years. Some learners were older than 14 years (the oldest learner was 15 years old). In Grade 6, the majority of learners were within the 12 to 14 age range. A few learners were older than 15 and the oldest age reported was 18. The high-end ages in both Grades 3 and 6 may be attributed to learners from rural schools starting their primary schooling at a late stage.

¹² Unidentified learners were excluded from gender comparisons.

Table 5: Age distribution of Grades 3 and 6 learners tested in the follow-up study

Grade 3			Grade 6		
Age range	Frequency	Percent	Age range	Frequency	Percent
7	6	0.6	10	6	0.6
8	115	11.8	11	96	10.1
9	399	41.0	12	312	32.8
10	261	26.7	13	260	27.4
11	107	11.0	14	161	16.9
12	54	5.5	15	69	7.3
13	14	1.4	16	30	3.2
14	5	0.5	17	9	0.9
15	3	0.3	18	2	0.2
Total	964	99.0	Total	945	99.5
Not known	11	1.0	Not known	5	0.5
Total	975	100.0	Total	950	99.9

2.4 ADMINISTRATION OF THE LEARNER TESTS

The design of the JET tests is informed by the core competences or LOs for the target grades as contained in the NCS. Test administration was carried out as follows:

2.4.1 Grade 3 instruments (Numeracy and Literacy)

For the Grade 3 learners (of 2005), two instruments (the Grade 3 Numeracy test and the Grade 3 Literacy test) were administered to learners in both the project sample and control schools.

The Grade 3 Numeracy instrument was administered first. After a break of 30 minutes, the Literacy instrument was administered to the same group of Grade 3 learners in each tested school.

The Grade 3 instruments were administered in the Language of Learning and Teaching (LOLT) at the school (i.e. in Afrikaans, isiZulu, isiXhosa, Sepedi, Tshivenda, Xitsonga or English).

2.4.2 Grade 6 instruments (Mathematics and Science)

For the Grade 6 learners (of 2005), two instruments (the Grade 6 Mathematics test and the Grade 6 Science test) were administered to learners in both the project sample and control schools.

The Grade 6 Mathematics instrument was administered first. After a break of 30 minutes, the Science instrument was administered to the same group of Grade 6 learners in each tested school.

The Grade 6 instruments were administered in the LOLT at the school. In most instances – at most project and control schools in the study – the LOLT in Grade 6 is English. However, a few schools in the sample project and control schools are using Afrikaans at this level (i.e. six schools in Northern Cape).

At both the Grades 3 and 6 levels, learners were given 90 minutes¹³ to complete each of the tests, although an additional 15 minutes were allowed where it was evident that 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 not all) of the learners struggled to finish either of the tests within 90 minutes, and learners often wrote for 1 hour and 45 minutes per session.¹⁴

The process for test administration is explained in more detail in the test administration manual, which is appended to this report in Appendix B.

2.5 FIELDWORKERS

Tests administrators were recruited using the following criteria:

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

Where possible, the same fieldworkers who had conducted the test administration in March 2005 were recruited for the follow-up study.

The fieldwork was overseen by four Provincial Co-ordinators, who re-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 guide for both the training and fieldwork processes.

Fieldwork for the follow-up study was conducted between 19 October and 4 November 2005.

Prior to school visits, the PED offices sent schools letters explaining the testing process. Where necessary, IEP Provincial Co-ordinators further communicated the date of the visit to both project and control schools. This facilitated access to schools and limited problems in the field.

2.6 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. Each JET Provincial Co-ordinator visited one of the sampled schools per day for monitoring and quality assurance purposes. In Eastern Cape, nine schools were quality assured; in KwaZulu-Natal, the total number of schools quality assured was nine; while three and four schools were quality assured in Limpopo and Northern

¹³ 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 levels as specified by the curriculum, each test would be completed within an hour.

¹⁴ 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 NCS.

Cape respectively. 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.

2.7 SCORING, DATA CAPTURE AND ANALYSIS

2.7.1 Scoring

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

- Knowledge of the different LOLTs 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.
- Where a question was out of two (2) or more marks, criteria in the memoranda guided the score allocation.

2.7.2 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.¹⁵

3. LEARNER PERFORMANCE RESULTS

3.1 INTRODUCTION

This section of the report provides the results of the Grade 3 Numeracy and Literacy, and the Grade 6 Mathematics and Science tests in the October 2005 Testing Period (follow-up phase), and compares them to the learner scores obtained in the baseline study phase. Minor fluctuations from one assessment to another may be expected due to chance variation of the data (especially since different cohorts of learners were tested). For this reason, a statistical test was conducted to ascertain the significance of any changes; with numbers as large as 1925¹⁶ even a very small change – such as half a percentage point – might well be significant.

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:

¹⁵ Refer to Appendix C for the data analysis framework.

¹⁶ The total number of learners tested in Grade 3 PLUS the total number of learners tested in Grade 6: 975 + 950.

- IEP cohort classification: Poor Performing (PP); Better Performing (BP); and First Time New Primary (FT);
- Provinces: Eastern Cape, KwaZulu-Natal, Limpopo and Northern Cape;
- gender; 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 of IEP schools drawn from different provinces are not indicative of the relative performances of the provinces as a whole, and do not necessarily imply anything about the quality of education provided in those provinces. This is because many factors – principally the socio-economic context of the learners – influence performance.

3.2 COMPARISON OF PERFORMANCE OF PROJECT AND CONTROL SCHOOLS

For this section, the overall learner performance results of project and control schools are compared.

3.2.1 Comparison across the four Learning Areas

Table 6 below compares the performance rates across each of the four LAs: Grade 3 Numeracy, Grade 3 Literacy, Grade 6 Mathematics, and Grade 6 Science. Significant differences are marked with an asterisk (*).

Table 6: Comparison of performance across Numeracy, Literacy, Mathematics and Science

LA	Group	Period	Mean	Min	Max	Std Dev	Project vs Control
Grade 3: Numeracy	Project	Baseline	26.03	0.00	85.7	16.22019	<p>Mean difference of 2.7 was statistically significant (p-value of .047 less than 0.05)</p> <p>Mean difference of 3.5 was statistically significant (p-value of .035 less than 0.05)</p> <p>Mean difference of 2.0 was statistically significant (p-value of .034 less than 0.05)</p> <p>Mean difference of 0.2 was NOT statistically significant (p-value of .0875 more than 0.05)</p>
		Follow-up	22.63	0.00	85.7	15.68425	
		Difference	-3.4*				
	Control	Baseline	23.56	0.00	83.3	15.84948	
		Follow-up	19.91	0.00	61.9	14.58299	
		Difference	-3.7*				
Grade 3: Literacy	Project	Baseline	41.98	0.00	92.5	21.04275	
		Follow-up	40.40	0.00	100.0	21.22970	
		Difference	-1.5				
	Control	Baseline	46.16	0.00	92.5	20.84481	
		Follow-up	36.87	0.00	77.5	18.26476	
		Difference	-9.2*				
Grade 6: Mathematics	Project	Baseline	21.57	.00	60.0	10.44553	
		Follow-up	22.00	1.00	64.0	10.39918	
		Difference	+0.43				
	Control	Baseline	22.72	.00	56.00	12.23120	
		Follow-up	19.97	2.00	48.00	11.10595	
		Difference	-2.75*				
Grade 6: Science	Project	Baseline	25.50	0.00	73.3	15.65993	
		Follow-up	25.27	0.00	71.9	14.10060	
		Difference	-0.22				
	Control	Baseline	25.91	0.00	66.7	17.93443	
		Follow-up	25.51	0.00	71.9	16.78973	
		Difference	-0.40				

* Significant at the 95% confidence level (or 0.05 level)

The difference between the baseline and follow-up scores for both project and control schools, as reflected in table 6 above, shows that there was a drop in the overall mean (performance rates) across three LAs (Numeracy, Literacy and Science). Only the project school performance on the Mathematics test showed a very slight improvement but this was not statistically significant at the 95% confidence level.

Interestingly, control schools showed a bigger drop than the project schools across the board. The general drop in performance mean scores in both project and control schools may be attributed to the fact that a different cohort of learners was tested in the follow-up phase (e.g. Grade 4 learners were tested for the baseline and Grade 3 learners for the follow-up).

These statistics suggest that at this stage the IEP intervention does not seem to have had a marked impact¹⁷ on the project schools in the sample. Although a drop was evident across the board, it should be noted that the negative change in project schools was generally not statistically significant. What is worthy of note, however, is that the reported declines are bigger in control schools than in project schools. Nevertheless, mean scores remain very low and subcontractors would do well to take steps to address more effectively the weaknesses identified both in the baseline study report and in this report.

3.2.2 Grade level of difficulty

Both the Numeracy and Mathematics tests are diagnostic in two ways – by skill and by grade level of difficulty. Thus, for Numeracy 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, while for Mathematics the same is done but for Grades 4, 5, 6 and 7. This section of the report considers the performance of learners on the grade level of difficulty dimension. A score of 50% was used as a benchmark and the proportion of learners who achieved this benchmark at each of the levels of difficulty was calculated.

1. Numeracy

The Numeracy test consisted of 84 items, distributed per grade in the following way:

Table 7: Item distribution per grade (difficulty level) and task on the Grade 3 Numeracy test

Level of difficulty	Task 1	Task 2	Task 3	Total	% of Total
Grade 1	7			7	8%
Grade 2	12	10	3	25	30%
Grade 3	8	14	20	42	50%
Grade 4		5	5	10	12%
Total	27	29	28	84	100%

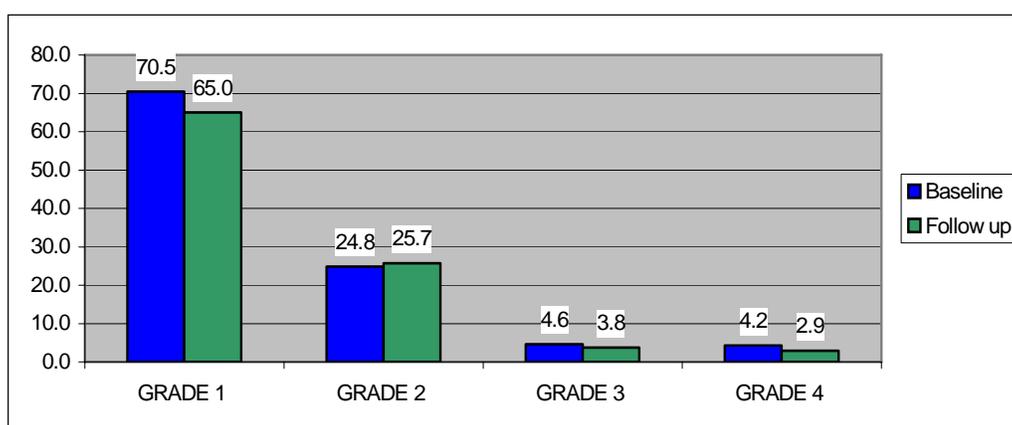
The percentage of Grade 3 learners in project schools achieving means of 50% or more at each level of difficulty is depicted in table 8 and graph 1 below.

¹⁷ As with most education research, causality is very difficult to establish because of the myriad of other factors that may be contributing to changes in performances (e.g. teaching styles, teaching and learning attitudes, school management, learner aptitudes, personal problems, socio-economic conditions, etc).

Table 8: Comparison of the number of Grade 3 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 achieving 50% or more	%	Difference
Project	Grade 1	Baseline	1229	866	70.5	-5.5
		Follow-up	824	536	65.0	
	Grade 2	Baseline	1229	305	24.8	+0.9
		Follow-up	824	212	25.7	
	Grade 3	Baseline	1229	57	4.6	-0.8
		Follow-up	824	31	3.8	
	Grade 4	Baseline	1229	52	4.2	-1.3
		Follow-up	824	24	2.9	
Control	Grade 1	Baseline	254	153	60.2	+6.7
		Follow-up	151	101	66.9	
	Grade 2	Baseline	254	39	15.4	+9.1
		Follow-up	151	37	24.5	
	Grade 3	Baseline	254	8	3.1	+0.2
		Follow-up	151	5	3.3	
	Grade 4	Baseline	254	15	5.9	-5.9
		Follow-up	151	0	0.0	

Graph 1: Comparison of the number of Grade 3 learners in project schools achieving 50% or more (per group) at each level, on the Numeracy test



The follow-up study findings shown in table 8 and graph 1 above reveal similar trends as in the baseline study. Thus, more learners in project 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, slightly fewer learners in project schools were able to answer Grade 1 level items in the follow-up study than in the baseline.

Slightly more learners were able to correctly answer **Grade 2** level items in the follow-up than in the baseline study, but this improvement of 1% still means that only a quarter (26%) of the learners in project schools are passing at a Grade 2 level. This

also means that the majority of learners (74%) in project schools have not progressed beyond the level of Grade 2.

The baseline study also showed that very few learners were able to correctly solve **Grade 3** level items – the expected level of performance for the sample. The follow-up results on Grade 3 level items was not much different from the baseline study. For both project and control schools very few learners in the follow-up study performed at a Grade 3 level. This is very worrying; most Grade 3 learners who were nearing completion of their Grade 3 year in 2005 were struggling to cope with Grade 3 Numeracy work. Again this means that a large percentage (96% in project schools and 97% in control schools) of learners is not sufficiently competent at the Grade 3 level.

Only 2.9% of project school learners in the follow-up study were able to answer **Grade 4** level items. This is 1.3% less than in the baseline study. However, as these were Grade 3 learners, it is expected that very few would be able to correctly answer Grade 4 level items. The fact that there are learners who can do Grade 4 level items is commendable and means that these ‘gifted’ learners should not go unnoticed.

For control schools, the pattern was similar in that the more difficult the level, the fewer the number of learners who achieved a mean of 50% or more. However, when compared to the baseline study, more Grade 3 learners in control schools who were tested in the follow-up study were able to solve problems at difficulty levels 1, 2, and 3. No learners in the control schools correctly answered Grade 4 level items.

2. Mathematics

The Grade 6 Mathematics test was made up of 100 items, distributed as follows in terms of level of difficulty:

Table 9: Item distribution per grade (difficulty level) and task on the Grade 6 Mathematics test

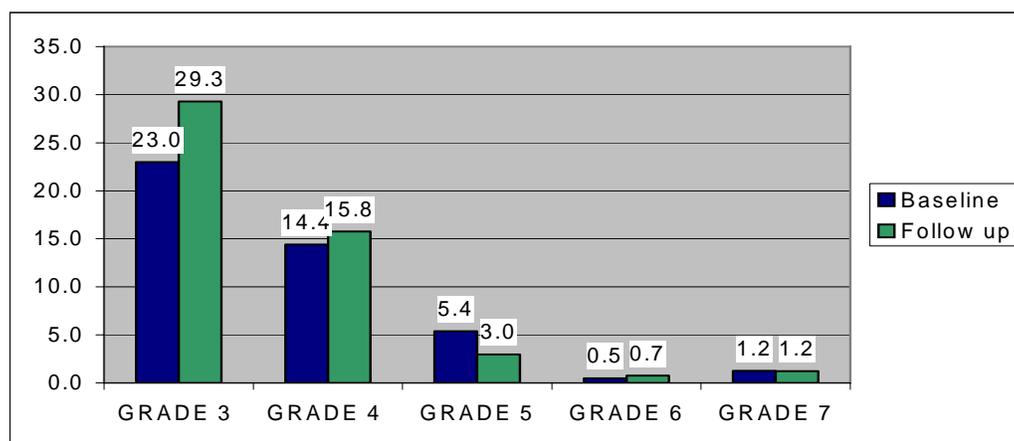
	Task 1 (LO1 & 2)	Task 2 (LO1 & 2)	Task 3 (LO3)	Task 4 (LO4)	Total
Grade 3	4		2	2	8
Grade 4	10	1	2	2	15
Grade 5	9	3	4	4	20
Grade 6	7	20	9	9	45
Grade 7		6	3	3	12
Total	30	30	20	20	100

As was done with the Numeracy test (above), table 10 and graph 2 below illustrate the percentage of Grade 6 learners in project schools achieving means of 50% or more on the Mathematics test.

Table 10: Comparison of the number of Grade 6 learners achieving 50% or more (per group) at each level, on the Mathematics test

Group	Level of difficulty	Testing Period	Total no. of learners tested	No. of learners achieving 50% or more	%	Difference	
Project	Grade 3	Baseline	1283	295	23.0	+ 6.3	
		Follow-up	806	236	29.3		
	Grade 4	Baseline	1283	185	14.4	+1.4	
		Follow-up	806	127	15.8		
	Grade 5	Baseline	1283	69	5.4	-2.4	
		Follow-up	806	24	3.0		
	Grade 6	Baseline	1283	6	0.5	+0.2	
		Follow-up	806	6	0.7		
	Grade 7	Baseline	1283	16	1.2	0	
		Follow-up	806	10	1.2		
	Control	Grade 3	Baseline	225	61	27.1	-3.7
			Follow-up	141	33	23.4	
Grade 4		Baseline	225	56	24.9	-15.0	
		Follow-up	141	14	9.9		
Grade 5		Baseline	225	23	10.2	-9.5	
		Follow-up	141	1	0.7		
Grade 6		Baseline	225	1	0.4	-0.4	
		Follow-up	141	0	0.0		
Grade 7		Baseline	225	2	0.9	+1.2	
		Follow-up	141	3	2.1		

Graph 2: Comparison of the number of Grade 6 learners in project schools achieving 50% or more (per group) at each level, on the Mathematics test per testing phase



The follow-up study findings shown in table 10 and graph 2 above reveal similar trends as those that emerged in the baseline study: the higher the level of difficulty on the test, the fewer the number of Grade 6 learners who achieved means of 50% or more. Thus, more learners in project schools were able to correctly answer **Grade**

3 level items than they were able to answer Grades 4, 5, 6 and 7 level items. However, it is important to note that, while the numbers increased by 6% between the baseline and follow-up studies, this increase was minor; at least 70% of learners in Grade 6 are not sufficiently able to correctly answer Grade 3 level items.

For **Grade 4** level items, slightly more learners were able to correctly answer items in the follow-up than in the baseline study, but this improvement of 1.4% still means that only a fifth (16%) of the learners in project schools are passing at a Grade 4 level. This also means that the majority of Grade 6 learners (84%) in project schools have not progressed beyond the level of Grade 4.

For **Grade 5** level items, significantly fewer Grade 6 learners achieved scores of 50% or more in the follow-up than in the baseline study. In fact, only 3% of learners successfully achieved this target in the follow-up study. This was 2.4% lower than in the baseline study. It is not clear why such a drop was experienced.

Both the baseline and follow-up phases have shown that very few learners are able to correctly solve **Grade 6** level items – the expected level of performance for the sample. The follow-up results on Grade 6 level items were not much different from the baseline study. Almost all Grade 6 learners (in both the follow-up and baseline studies) failed to attain the 50% benchmark. This means that almost all Grade 6 learners tested were not sufficiently competent at the Grade 6 level. Again, this is very worrying because most Grade 6 learners who were nearing completion of their Grade 6 year in 2005 were struggling to cope with Grade 6 Mathematics work.

3.3 PERFORMANCE OF PROJECT SCHOOLS ONLY

For this section, comparison of baseline and follow-up study results is done for each LA, i.e. Numeracy, Literacy, Mathematics and Science. This comparison is done for each of the following variables: IEP cohort, province, gender and knowledge/skill domains.

3.3.1 IEP cohort

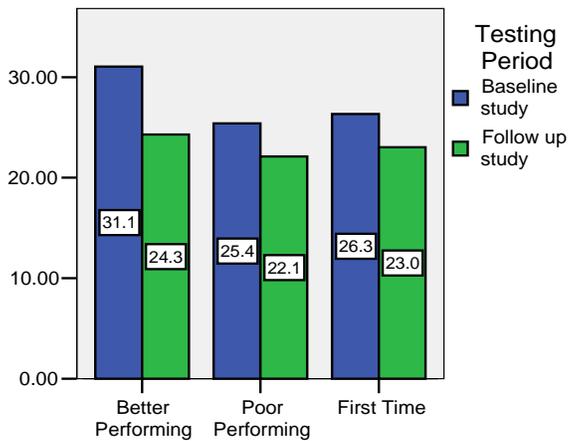
Tables 11, 12, 13 and 14 below compare the baseline and follow-up study results across the three IEP cohorts: Poor Performing, Better Performing, and First Time New Primary, for each of the LAs tested. Significant differences are marked with an asterisk (*).

Table 11: Comparison of mean performances across IEP cohorts on the Numeracy test

IEP Cohort	Testing Period	N	Mean	Std Deviation	Min	Max
Cohort 1: Poor Performing	Baseline	906	25.41	15.67532	0.00	84.52
	Follow-up	483	22.11	14.12011	0.00	69.05
	Difference		-3.30*			
Cohort 2: Better Performing	Baseline	95	31.07	16.57966	3.57	77.38
	Follow-up	93	24.30	16.69736	0.00	72.62
	Difference		-6.80*			
Cohort 3: First Time New Primary	Baseline	278	26.35	17.54182	0.00	85.71
	Follow-up	248	23.04	18.02783	0.00	85.71
	Difference		-3.31*			

* Significant at the 95% confidence level

Graph 3: Comparison of overall mean by IEP cohort – Numeracy



Between the baseline study and the follow-up study, the overall mean dropped across all cohorts in Numeracy.

The biggest drop was experienced by the Better Performing cohort (7%).

The Poor Performing and First Time cohorts dropped by 3% each.

A test of significance shows that all mean differences were statistically significant at the 95% confidence level.

Table 12: Comparison of mean performances across IEP cohorts on the Literacy test

IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
Cohort 1: Poor Performing	Baseline	915	41.51	21.17691	0.00	92.50
	Follow-up	483	41.26	21.07053	0.00	100.00
	Difference		-0.25			
Cohort 2: Better Performing	Baseline	95	43.18	16.27327	7.50	77.50
	Follow-up	93	47.12	16.64832	7.50	82.50
	Difference		+3.94			
Cohort 3: First Time New Primary	Baseline	279	43.13	22.02253	0.00	92.50
	Follow-up	248	36.19	22.26761	0.00	87.50
	Difference		-6.94*			

* Significant at the 95% confidence level

For Literacy, only the Better Performing cohort improved. Although the improvement was marginal, a test of significance reveals that the improvement was statistically significant.

The First Time New Primary cohort experienced the biggest drop since the baseline study. This mean difference of 7% was statistically significant.

The Poor Performing cohort declined very slightly (0.3%). This was not statistically significant at the 95% confidence level.

Graph 4: Comparison of overall mean by IEP cohort – Literacy

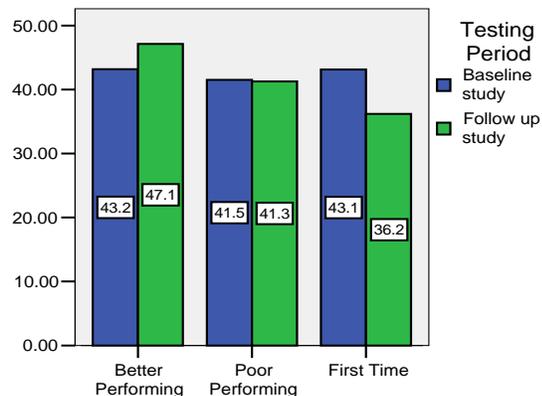
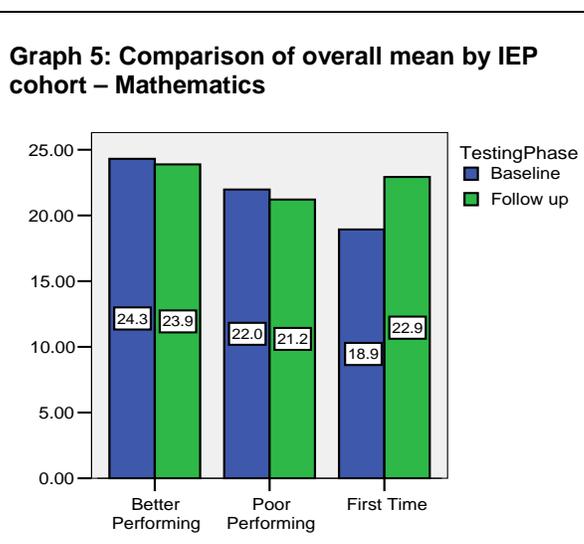


Table 13: Comparison of mean performances across IEP cohorts on the Mathematics test

IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
Cohort 1: Poor Performing	Baseline	934	21.98	10.64600	0.00	60.00
	Follow-up	491	21.21	9.88071	1.00	55.00
	Difference		-0.77			
Cohort 2: Better Performing	Baseline	100	24.32	10.56952	0.00	54.00
	Follow-up	102	23.88	10.53922	3.00	61.00
	Difference		-0.44			
Cohort 3: First Time New Primary	Baseline	249	18.93	9.07537	0.00	58.00
	Follow-up	213	22.93	11.31620	1.00	64.00
	Difference		+3.40*			

* Significant at the 95% confidence level



In terms of Mathematics, both the Better Performing and Poor Performing cohorts experienced a drop in their mean test scores between the baseline and follow-up studies. However, the mean difference was very slight and not statistically significant.

The First Time cohort was also the only one that improved between the baseline and follow-up studies. This difference of 3.4% was statistically significant at the 95% confidence level.

Table 14: Comparison of mean performances across IEP cohorts on the Science test

IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
Cohort 1: Poor Performing	Baseline	940	25.89	16.33809	0.00	73.33
	Follow-up	496	24.44	14.07742	0.00	71.88
	Difference		-1.45			
Cohort 2: Better Performing	Baseline	100	29.23	14.42388	0.00	60.00
	Follow-up	102	20.25	11.99257	0.00	53.13
	Difference		-8.98*			
Cohort 3: First Time New Primary	Baseline	248	22.51	12.82428	0.00	60.00
	Follow-up	211	29.67	13.97998	0.00	68.75
	Difference		+7.15*			

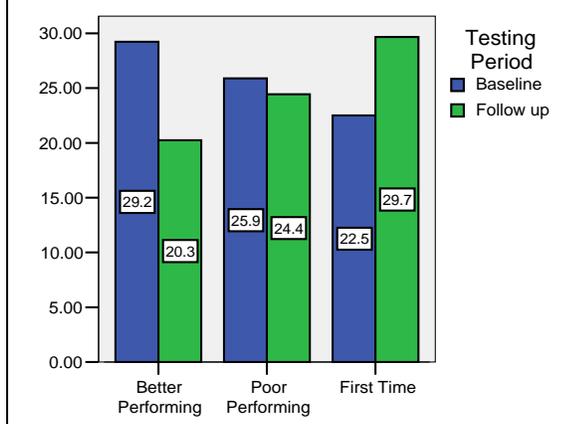
* Significant at the 95% confidence level

For Science, the Poor Performing cohort dropped very slightly (1%) between the baseline and follow-up studies. This difference was not statistically significant.

The Better Performing cohort experienced a more significant drop (9%). In fact, this was the biggest drop when compared to the other LAs. This mean difference was statistically significant.

In contrast, the First Time cohort showed the biggest improvement (7%). This mean difference was statistically significant at the 95% confidence level.

Graph 6: Comparison of overall mean by IEP cohort – Science



3.3.2 Province

Tables 15, 16, 17 and 18 below compare the baseline and follow-up study results across the four provinces: Eastern Cape, KwaZulu-Natal, Limpopo and Northern Cape, for each of the LAs tested.

1. Grade 3 Numeracy

Table 15: Comparison of mean performances across provinces on the Numeracy test

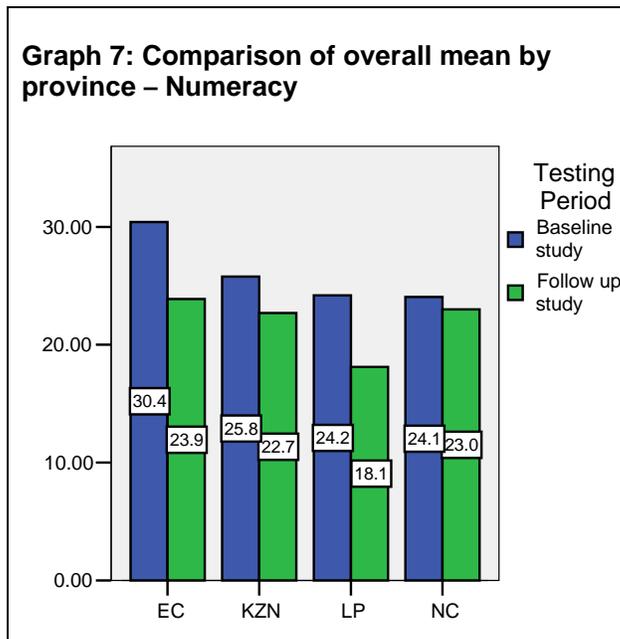
Province	Testing Period	N	Mean	Std Deviation	Min	Max
EC	Baseline	309	30.41	17.44904	0.00	85.71
	Follow-up	314	23.88	16.36717	0.00	85.71
	Difference		-6.53*			
KZN	Baseline	284	25.78	13.56943	1.19	73.81
	Follow-up	283	22.69	14.36710	0.00	69.05
	Difference		-3.09*			
LP	Baseline	569	24.19	15.85015	0.00	84.52
	Follow-up	100	18.12	11.94507	1.19	53.57
	Difference		-6.07*			
NC	Baseline	117	24.05	18.41065	0.00	80.95
	Follow-up	127	23.00	18.62960	0.00	72.62
	Difference		-1.05			

* Significant at the 95% level

In Numeracy, between the baseline and follow-up studies all provinces showed a drop in mean scores. Except for Northern Cape, the mean differences were all found to be statistically significant at the 95% confidence level.

- The biggest drop in mean score was experienced by Eastern Cape. This province dropped by almost 7%, to 24% in the follow-up study. Although Eastern Cape experienced the biggest drop, this province attained the highest mean score in comparison to the other provinces.

- Limpopo experienced the second highest drop (6%) and was the province that attained the lowest mean score (18%).



- Between the baseline and follow-up studies, KwaZulu-Natal also showed a decline in the Numeracy test.
- In the case of Northern Cape there was also a decline in mean score, but the 1% drop was marginal and not statistically significant. This province obtained the second highest mean in comparison to the other provinces; however, the mean is still very low.

2. Grade 3 Literacy

Table 16: Comparison of mean performances across provinces on the Literacy test

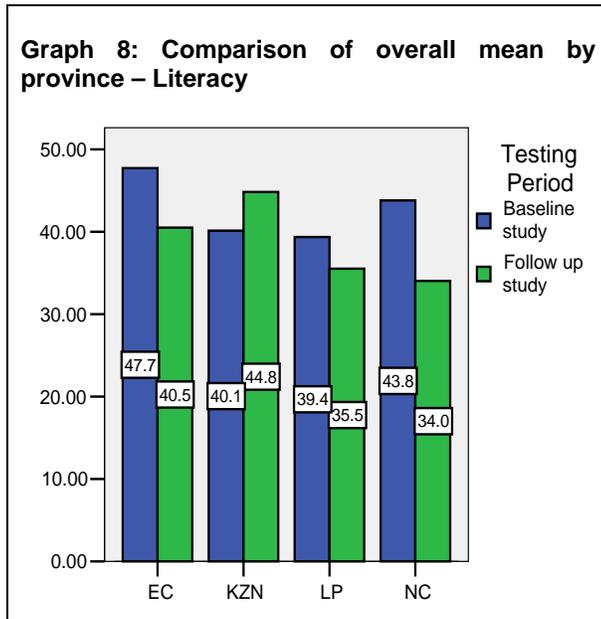
IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
EC	Baseline	310	47.74	21.71132	0.00	90.00
	Follow-up	315	40.51	18.61175	0.00	87.50
	Difference		-7.23*			
KZN	Baseline	285	40.13	20.54185	0.00	87.50
	Follow-up	283	44.82	21.04147	0.00	85.00
	Difference		+4.69*			
LP	Baseline	568	39.36	20.99802	0.00	92.50
	Follow-up	100	35.53	24.51627	0.00	100.00
	Difference		-3.83			
NC	Baseline	126	43.81	17.71924	7.50	92.50
	Follow-up	126	34.05	22.76809	0.00	85.00
	Difference		-9.76*			

* Significant at the 95% confidence level

For Literacy, most provinces showed a drop in their performance scores, between the baseline and follow-up studies.

- The biggest drop was experienced by Northern Cape. The province dropped by almost 10% to an overall mean score of 34% – the lowest overall score in comparison to other provinces. This 10% drop was statistically significant at the 95% confidence level.

- Eastern Cape experienced the second highest drop. The 7% drop was also statistically significant.
- Limpopo dropped the least (4%) between the baseline and follow-up. Although the mean difference was not statistically significant, the overall mean score of 36% is still very low.
- The only province that showed an improvement was KwaZulu-Natal. This province improved by almost 5% between baseline and follow-up, obtaining an overall mean score of 45%. This mean score makes IEP schools in KwaZulu-Natal the best performing in terms of Literacy.



3. Grade 6 Mathematics

Table 17: Comparison of mean performances across provinces on the Mathematics test

IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
EC	Baseline	308	19.25	8.52497	0.00	50.00
	Follow-up	297	22.98	10.29019	1.00	57.00
	Difference		+3.73*			
KZN	Baseline	304	19.83	9.30449	0.00	54.00
	Follow-up	290	17.66	8.92126	1.00	61.00
	Difference		-2.17*			
LP	Baseline	551	23.47	11.29370	0.00	54.00
	Follow-up	102	24.50	10.10612	3.00	55.00
	Difference		+1.03			
NC	Baseline	120	23.27	11.69122	0.00	60.00
	Follow-up	117	28.13	10.00650	8.00	64.00
	Difference		+4.86*			

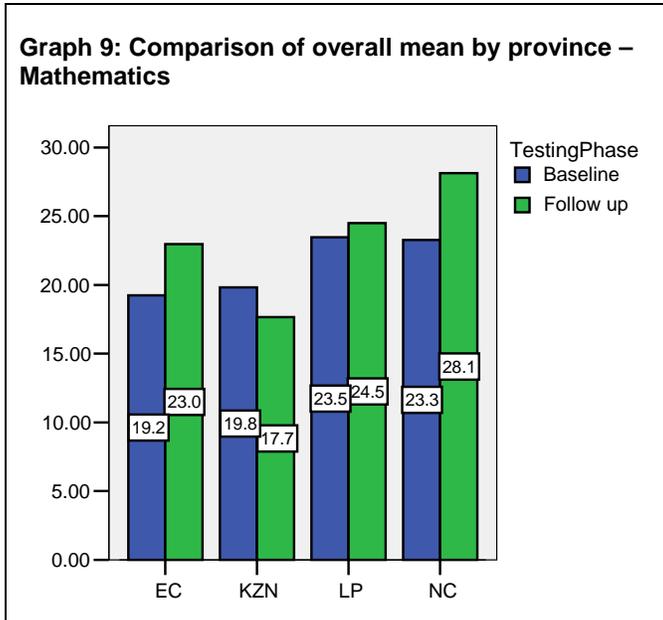
* Significant at the 95% confidence level

In terms of Mathematics, three provinces showed an improvement between baseline and follow-up studies:

- Northern Cape showed the biggest improvement. The mean difference of 5%, which was found to be statistically significant, means that this province

obtained the highest mean score in comparison to the other provinces. However, the mean is still below 30%.

- Eastern Cape improved by almost 4%, obtaining an overall mean score of 23% in the follow-up study. This was the second highest improvement when compared to other provinces. This mean difference was statistically significant.



- Limpopo also improved, but the improvement was very slight and was not statistically significant.
- KwaZulu-Natal was the only province that showed a drop between baseline and follow-up study. The 2% drop was marginal but statistically significant.

4. Grade 6 Science

Table 18: Comparison of mean performances across provinces on the Science test

IEP cohort	Testing Period	N	Mean	Std Deviation	Min	Max
EC	Baseline	307	24.60	13.60082	0.00	73.33
	Follow-up	295	32.27	12.11735	0.00	71.88
	Difference		+7.65*			
KZN	Baseline	302	24.03	15.04252	0.00	73.33
	Follow-up	295	15.84	9.95353	0.00	50.00
	Difference		-8.19*			
LP	Baseline	556	26.64	16.98669	0.00	70.00
	Follow-up	102	26.81	14.78521	3.13	59.38
	Difference		+0.17			
NC	Baseline	123	26.18	15.43942	0.00	70.00
	Follow-up	117	30.13	13.96615	0.00	68.75
	Difference		+3.94*			

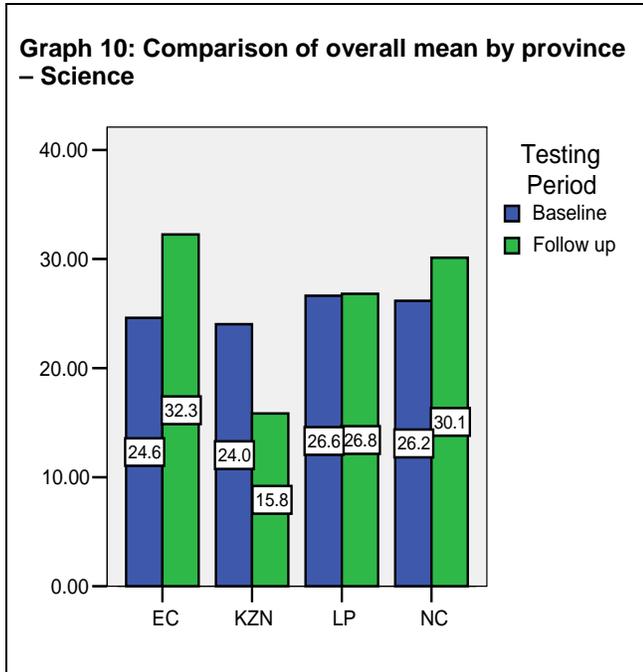
* Significant at the 95% confidence level

In Science, all provinces showed an improvement except for KwaZulu-Natal where a decline was experienced.

- Eastern Cape improved from 25% in the baseline to 32% in the follow-up. This 7.7% improvement was the highest improvement in comparison to the

other provinces. A test of significance revealed that this mean difference was statistically significant at the 95% confidence level.

- The second highest improvement was experienced in the Northern Cape. This province improved by almost 4% between baseline and follow-up, obtaining an overall mean of 30%. This improvement was also statistically significant at the 95% confidence level.
- Limpopo experienced the lowest improvement. In fact, the mean difference (0.2%) was marginal and was not statistically significant. This suggests that there is some stagnation in this province.
- KwaZulu-Natal was the only province that experienced a marked drop in its mean score. The statistics above show that this mean difference of 8% is statistically significant.



3.3.3 Gender

Table 19 compares the performance rates of girls and boys across each of the four LAs.

Table 19: Comparison of performances across Numeracy, Literacy, Mathematics and Science, as disaggregated by gender

Learning Area	Gender	Group	Mean	Min	Max	Std Deviation
Grade 3: Numeracy	Girls	Baseline	26.39	.00	85.71	16.12003
		Follow-up	23.26	.00	85.71	16.38337
		Difference	-3.13*			
	Boys	Baseline	25.39	.00	79.76	16.11989
		Follow-up	21.95	.00	73.81	14.99926
		Difference	-3.44*			
Grade 3: Literacy	Girls	Baseline	42.75	.00	92.50	21.09545
		Follow-up	43.67	.00	100.00	21.50524
		Difference	+0.92			
	Boys	Baseline	41.65	.00	92.50	20.94008
		Follow-up	37.49	.00	85.00	20.31617
		Difference	-4.16*			

Grade 6: Mathematics	Girls	Baseline	21.43	.00	60.00	10.47096
		Follow-up	22.72	1.00	55.00	10.06779
		Difference	+1.23			
	Boys	Baseline	21.83	.00	57.00	10.37767
		Follow-up	21.36	1.00	64.00	10.67926
		Difference	-0.46			
Grade 6: Science	Girls	Baseline	25.71	.00	73.33	15.99962
		Follow-up	25.49	.00	65.63	13.76274
		Difference	-0.22			
	Boys	Baseline	25.31	.00	73.33	15.32629
		Follow-up	25.08	.00	71.88	14.45686
		Difference	-0.23			

* Significant at the 95% confidence level

Generally, girls performed better than boys across all LAs in the follow-up study. This was especially so in Literacy where girls performed 6% better than boys, which was the only significant difference. This is in line with international studies (e.g. the Progress in International Reading Literacy Study, or PIRLS), which found that in all 35 countries surveyed, fourth-grade girls had significantly higher average achievement than boys.

In terms of comparing the baseline results to the follow-up results, significant negative differences were evident in Numeracy for both girls and boys (3.1% and 3.4% respectively), as well as for boys in Literacy (4%). The only improvement between the baseline and follow-up studies was by girls in Mathematics (1.2%), but this was not statistically significant at a 95% confidence level.

3.3.4 Learning Area knowledge/skill domains

1. Grade 3 Numeracy

The knowledge/skill domains assessed by the Grade 3 Numeracy test are (i) counting, ordering, number representation; (ii) addition; (iii) subtraction; (iv) multiplication; and (v) division. Table 20 shows the item distribution per skill.

Table 20: Item distribution per skill on the Grade 3 Numeracy test

	Ordering	Addition	Subtraction	Multiplication	Division	Total	% of Total per task
Task 1¹⁸							
Contextual	1	3	1	1	2	8	30%
Non-contextual	5	6	5	3	0	19	70%
Task 2							
Contextual	1	2	2	2	1	8	28%
Non-contextual	5	7	6	2	1	21	72%
Task 3							
Contextual	2	0	1	3	5	11	39%
Non-contextual	6	4	3	2	2	17	61%
Total	20	22	18	13	11	84	
% of Total	24%	26%	21%	15%	13%	100%	

¹⁸ The test was divided into three tasks, with the different skills and LOs spread across the tasks. This was for no other purpose than structuring the test.

Notes:

- 32% contextual questions overall;
- Division includes 'equal sharing' problems;
- Ordering includes counting, identifying, representing and comparing numbers; and
- There is a high percentage of contextual questions in Task 3 because this task includes fractions, and most of the questions relating to fractions are done in contexts.

Table 21 below compares the mean percentage for the Grade 3 learners in project schools on each of these five knowledge/skill domains.

Table 21: Comparison of mean scores across the Numeracy skills

Skill	Testing Period	Mean	Std Deviation	Min	Max
Counting	Baseline	28.9148	17.81464	0.00	85.00
	Follow-up	25.2727	18.38318	0.00	75.00
	Difference	-3.64*			
Addition	Baseline	32.0367	20.89937	0.00	95.00
	Follow-up	28.0554	19.36443	0.00	95.45
	Difference	-3.98*			
Subtraction	Baseline	25.5739	20.00874	0.00	94.00
	Follow-up	23.4009	20.58539	0.00	100.00
	Difference	-2.17*			
Multiplication	Baseline	24.6497	19.69162	0.00	100.00
	Follow-up	22.0974	18.23749	0.00	76.92
	Difference	-2.55*			
Division	Baseline	11.3800	13.27856	0.00	91.00
	Follow-up	8.6604	12.17943	0.00	81.82
	Difference	-2.72*			

* Significant at the 95% confidence level

Table 21 shows that the mean score dropped for each of the five Numeracy skills. A test of significance revealed that all differences were significant at the 95% confidence level. Counting and addition, which form the basic building blocks of Numeracy, showed the biggest drop (3.6% and 3.9% respectively). Despite these drops, these two skills continue to be the main strengths of Grade 3 learners in project schools. Division continues to be the greatest challenge. In order to ascertain the strengths and weaknesses for the follow-up study, an item analysis was conducted for each of the Numeracy skills.

Counting:

The items that learners found easiest were those requiring simple skip counting. Learners found counting in ones or twos easier than counting in fives and tens; and these items in turn were easier for them than counting in 25s and 50s. Counting backwards was much more difficult than counting forwards, although counting backwards in 100s was easier than counting backwards or skip counting backwards in twos.

When fractions are encountered, the mean score drops dramatically. Thus, almost all learners were unable to order,

describe or compare common fractions including halves, quarters and thirds.

Learners continue to struggle with rounding off skills (e.g. rounding off to the nearest 10). Rounding off is key to accurate estimation, which in turn is a very important component skill of problem solving and checking whether answers are feasible. Thus, the inability to round off has serious implications for the mathematical development of learners.

It is important that teachers in IEP schools be aware that their Grade 3 learners are generally underperforming on this skill – they are not performing at expected levels of difficulty and most learners still cannot competently answer items requiring counting, representing and ordering numbers.

Addition: Learners' capacity to add lessened as the numbers involved in the problem increased. Thus, learners were better able to correctly add one and two-digit numbers (e.g. $13 + 9$) than they were able to add two triple-digit numbers (e.g. $452 + 148$). Many learners struggled to correctly solve items requiring carrying or crossing over the number 100.

Subtraction: Learners are better able to correctly solve subtraction items that require the subtraction of a double-digit and a single-digit number (e.g. $16 - 7$). Similar to the trend evidenced in addition, as the number of digits involved in the problem increased, learners found it more difficult to correctly solve the problem (e.g. $368 - 149$).

Multiplication: Generally, learners found the multiplication of two 1-digit numbers (e.g. 3×4) relatively easy, but struggled as the numbers in the problems increased. For example, multiplication of a 2-digit number by a 1-digit number, which is a requirement for Grade 3 in the NCS, is answered less well by learners. The item analysis shows that the multiplication problems on which learners performed the best were items specifically geared for the Grade 2 level.

The majority of learners who were tested in the follow-up study continue to calculate the multiplication problems using continuous addition. The failure of learners to progress to more efficient multiplication algorithms is another factor 'stunting' the growth in Mathematics.

Division: Division items posed the greatest challenge for learners, where the overall mean percent was less than 10%.

The fact that so many learners are struggling with division is not an uncommon phenomenon in the South African education context. Previous JET studies have also shown that division tends to be the most difficult skill to master for learners in Grades 3 and 4. However, according to the Grade 3 curriculum, learners should be able to solve problems that require the division of at least 2-digit numbers by 1-digit numbers. This is currently a challenge for learners in IEP project schools.

Table 22 below compares the performance scores in terms of contextual and non-contextual questions across each of the five Numeracy skills assessed by the JET Grade 3 Numeracy test.

Table 22: Comparison of mean scores across the contextual and non-contextual items on the Numeracy test

	Testing Period	Mean	Std Deviation	Min	Max
Contextual	Baseline	15.78	14.66966	0.00	81.48
	Follow-up	12.47	13.44549	0.00	88.89
	Difference	-3.32*			
Non-contextual	Baseline	31.41	18.73881	0.00	92.98
	Follow-up	27.89	18.43073	0.00	84.21
	Difference	-3.52*			

* Significant at the 95% confidence level

Overall, learners performed considerably better on items that were straight arithmetic (non-contextual questions) than on contextualised word problems, which require some reading. However, there was a much larger standard deviation score for non-contextual items than for contextual items, which suggests a wide variation in learners' scores for non-contextual questions. The baseline study results revealed a similar trend.

Generally, Mathematical word problems are more difficult to answer, as they require not only a good level of Literacy ability but also a high level of cognitive skill. The fact that so few learners at Grade 3 level are able to answer contextual questions correctly, or even to attempt them, suggests that these learners are either not reading at appropriate levels or do not know how to interpret word problems.

The difficulties experienced by Grade 3 learners in project schools in the follow-up study are very similar to those experienced in the baseline study. Subcontractors would do well to focus on the basic building blocks of Numeracy (counting, ordering and number representation and addition) before moving on to the more difficult skills (such as subtraction, multiplication and division). It is also recommended that the learners be confronted with more contextually based numerical problems, provided their reading and Literacy levels are stimulated at appropriate levels in the relevant language LAs.

2. Grade 3 Literacy

As mentioned in the baseline report, the following core reading and writing competences or LOs, as required by the NCS, are assessed in the Grade 3 Literacy/Language test:¹⁹

¹⁹ Assessment frameworks for the Literacy tests were constructed before the instruments were developed. These assessment frameworks were constructed using the guidelines as set out by the NCS Assessment Standards document, with specific reference to the Grade 3 Reading and Writing curriculum, English Second Language. For each grade, the relevant LOs were identified, along with the Assessment Standard and types of activities that the learner should be able to do in relation to the LO.

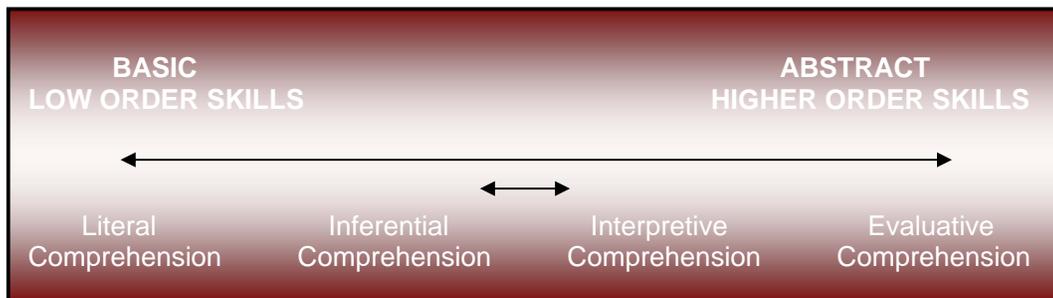
- Reading and viewing, where the learner is expected to be able to read and view for information and enjoyment, and respond critically to the aesthetic, cultural and emotional values in text;
- Thinking and reasoning, referring to the learner's ability to use language to think and reason, as well as to access, process and use information for learning; and
- Writing, where the learner is expected to write different kinds of factual and imaginative texts for a wide range of purposes.

In particular, the Literacy test assesses learners' ability to access information, infer information, use language in context, and apply information from a variety of forms such as illustrations, graphs, etc. However, these three skills are not mutually exclusive. For example, an item that requires Reading and Viewing for comprehension, may also involve Thinking and Reasoning to generate a response, which will then require Writing in order to be communicated.

For this reason, it makes little sense to report the results of the Literacy test in terms of these overlapping categories. It was therefore decided to categorise each item according to the following three dimensions:

- Types of text (narrative; visual cues, pie graphs; tables; etc.);
- Types of questions (i.e. multiple choice; short answers; and extended responses); and
- Types of skill (i.e. *literal comprehension* where straightforward search and retrieval takes place; *inferential comprehension* where inferences are made; *interpretive comprehension* where readers have to read, interpret and integrate ideas and information; and *evaluative comprehension*, a higher order skill where readers need to read beyond the text). A diagrammatic representation of these skills is presented below.

Box 1: Diagrammatic representation of Literacy skills along difficulty continuum



Appendix D lists all items according to these three dimensions, and gives the overall mean score obtained by the Grade 3 learners tested in the sample for each item.

Box 2 (as taken from the PIRLS²⁰ report, 2005)

In focusing on and retrieving explicitly stated information, readers use various ways to locate and understand content that is relevant to the question posed. Retrieving appropriate text information requires that the reader not only understand what is stated explicitly in the text, but also how that information is related to the information sought. This is also known as basic *Literal Comprehension*.

In terms of *Inferential Comprehension*, readers construct meaning from text by making inferences about ideas or information not explicitly stated in the text. Some of these inferences are straightforward in that they are based mostly on information that is contained in the text. In other words, the reader may need to connect two or more pieces of information. Although these ideas may be explicitly stated, the connection between them is not and thus must be inferred.

However, as readers interpret and integrate ideas and information in the text, they often need to draw on their understanding of the world. In other words, they are making connections that are not only implicit, but they may be open to some interpretation based on their own perspective. Readers are reading 'between the lines'. This is called *Interpretive Comprehension*.

When readers have to read 'beyond the lines', they are assessing the ideas or facts in a text according to whether texts are done appropriately (i.e. appropriacy), effectiveness, relevance and accuracy so as to be able to make a value judgement. This type of skill is known as *Evaluative Comprehension*.

Appendix D is summarised in table 23 below.

Table 23: Comparison of overall test means between baseline and follow-up results on each of the seven questions in the Literacy test

Question	Question description	Literacy skill assessed	Baseline	Follow-up	Difference
Question 1	Comprehension exercise based on narrative text, fiction	Mainly literal comprehension with some inferential and interpretive comprehension	43.22	34.01	-9.20*
Question 2	Learners are required to link words to appropriate picture	Literal comprehension	69.51	67.98	-1.53
Question 3	Cartoon structured narrative: comprehension	Mainly inferential comprehension	28.84	28.06	-0.79

²⁰ PIRLS is an ongoing project of the International Association for the Evaluation of Educational Achievement (IEA). The IEA is an international co-operative of national research institutes and government agencies that has been conducting studies of cross-national achievement for more than 40 years. Thirty-five countries participated in this study, which measured reading Literacy achievement of fourth-grade students (ages 9 and 10) and gathered information about home and school factors associated with learning to read. In each country, samples of approximately 3 500 students were assessed in about 150 schools. Data collection began in March 2001 for Northern Hemisphere countries, and in October 2001 for countries in the Southern Hemisphere.

Question 4	Exercise requiring learners to write five sentences describing what they see in the picture provided	Interpretive comprehension with some literal comprehension	43.86	48.79	+4.92*
Question 5.1	Cloze test with visual cues: fill in words in appropriate sentence context	Evaluative comprehension	30.95	30.73	-0.22
Question 5.2	Pie graph: answer questions related to pie graph	Evaluative comprehension	30.41	21.42	-8.99*
Question 6	Table: answer questions related to table	Evaluative comprehension	27.21	16.48	-10.74*
Question 7	Narrative: find words in passage	Literal comprehension	48.39	49.20	+0.81

* Significant at the 95% confidence level

Question 1

This question was made up of five multiple choice question (MCQ) items, which required learners to either search and retrieve explicitly stated information from the text (in this case a continuous narrative), make straightforward inferences, or interpret and integrate ideas and information (see Box 1).

The performance scores show that learners tended to respond better to items that were simple, straightforward search and retrieve items (e.g. Items 1.1 and 1.2) than to the search and retrieve items that, although explicitly stated, required a greater level of reading ability and are therefore more difficult (e.g. Item 1.3). Items that required interpretation and integration of information (e.g. Item 1.5) and inferences to be made (e.g. Item 1.4) were more challenging for Grade 3 learners in both the baseline and follow-up studies. This would suggest that not many Grade 3 learners are able to construct meaning through interpreting and integrating ideas and information from the text and relate it back to their own experiences and knowledge.

Overall, a mean score of 34% was achieved in the follow-up study (see table 24 above). This was 9% lower than in the baseline study.

Question 2

This question required that learners link a word to the appropriate visual cue. There were five words in total. Overall, learners scored the best on this question, where a mean of 70% was achieved in the baseline and 68% in the follow-up study. This would suggest that most Grade 3 learners understood the literal meaning of the words presented to them and were able to recognise these words in relation to the illustration provided.

Question 3

This question was also a narrative text, but the narrative was structured as a cartoon. Learners were required to answer primarily MCQs, which required learners either to search and retrieve explicitly stated information from the text or to make straightforward inferences.

The performance scores show that learners tended to respond better on items that were straightforward search and retrieve items (e.g. Item 3.1) and performed less well on inference type items (i.e. Items 3.2, 3.3, 3.4 and 3.5). Overall, a mean score of 28% was achieved for this question. In comparison to the baseline, very little changed in the follow-up study – there was a slight drop of 0.8% but this was not statistically significant (see table 24).

Question 4

This question aimed at eliciting extended responses from learners and required learners to interpret and interrogate information as well as make value judgements. The main objective of this question was to assess writing abilities of the Grade 3 learners in the sample. Overall, a mean score of 49% was achieved in the follow-up study, which was a 5% improvement on the baseline study score.

For this question, learners were required to write five sentences describing what they saw in a picture. A maximum score of two (2) was awarded if learners' responses demonstrated an understanding of visual images where minimal context is provided and if these sentences contained the correct spelling of words, tenses, grammar and punctuation. If the sentence was incoherent, no marks were awarded. If sentences were related to the picture, but the response had spelling, grammatical or tense mistakes, a mark of one (1) was awarded.

The item analysis showed that generally mean scores²¹ hovered around 1.00. This suggests that learners tended to write vaguely, that they were able to make reference to what was in the picture but could not necessarily punctuate properly, or the verb was not in the correct form.

In some instances, the writing was so illegible that it was virtually impossible to decipher what was on the page. In other cases, the sentences did not make any sense and a score of zero (0) was given.

Question 5

This question was made up of two sections: sections 5.1 and 5.2.

Section 5.1, which comprised 4 items, was a cloze test, i.e. key words required in the answer were listed and learners simply had to pick the best word for a particular sentence. This question required learners to make value judgements by assessing the appropriacy, relevance and accuracy of vocabulary. Overall, learners scored 31% on this question for both the baseline and follow-up studies. This would suggest that Grade 3 learners are still struggling with evaluative comprehension skills.

²¹ This is not the same thing as mean percentages. As the maximum score allowed for each of the items in this question was 2, mean scores ranged between 0 and 2. To convert this into a mean percentage, the mean score was divided by 2 and multiplied by 100. All other question items had a maximum score of 1, which meant that the mean score was simply multiplied by 100 to convert it into a percentage value.

However, as demonstrated in Box 1, evaluative comprehension is considered a higher order skill, which is usually the most difficult.

For **Section 5.2**, learners were required to interpret and integrate ideas and information to be able to answer questions related to a visual cue – in this case a pie graph. This section was made up of two items that were posed as true or false type items. Again, this question was assessing the learners' ability to do evaluative comprehension. Learners did not perform very well on these two items, with an overall score of 21% being attained.

Question 6

Similar to question 5, question 6 assessed a reader's ability to interpret and integrate ideas and information, in order to answer questions related to a visual cue and evaluate the information to make value judgements. In this question the visual cue was a table. Learners were expected to write short answers. The performance scores show that learners struggled to answer these question items correctly, especially in the follow-up study where a very low mean of 16% was obtained. Again this shows that in terms of Literacy abilities, items that assess evaluative comprehension are experienced as being the most difficult by Grade 3 learners.

Question 7

The last question on the Literacy paper was made up primarily of search and retrieve type questions. Learners were required to read a passage and then find and circle or underline the listed words in the passage. The performance scores show that learners performed reasonably well, with an overall score of just under 50% for both the baseline and follow-up studies.

On the basis of the above results on the Literacy test, IEP subcontractors would do well to:

- Get teachers to pay greater attention to exposing learners to different types of text or genres (e.g. tables, cartoons, narratives, etc.), while at the same time developing strategies on how to interact with these different reading texts, identify main ideas, and explain and support their understanding of what they had read. In other words, teachers need to use scaffolding as a methodology in the teaching of reading and writing.
- Assist teachers to spend more time on reading instructions and planning their reading programmes. At the Grade 3 level, the emphasis for the Grade 3 learner focuses on *learning to read* and once learners have mastery of the reading strategies and skills, the emphasis shifts to *reading to learn*. If the basics on how to read and write are not in place, learners will struggle to learn at subsequent levels and in other LAs; in other words learners will struggle with interpretive and evaluative comprehensions.
- Encourage teachers to promote independent reading (e.g. reading at home as well as in the classroom).
- Suggest that learners do more written work.

3. Grade 6 Mathematics

As specified in the baseline report, the Grade 6 Mathematics test assessed the four LOs, which were disaggregated into the following Mathematical competences, using the Assessment Standards specified in the NCS:

- 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 percentages

- 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.

Table 24 below compares the mean percentage for the Grade 6 learners in project schools across the four LOs.

Table 24: Comparison of mean scores across each of the Grade 6 Mathematics LOs

Learning Outcome	Statistics	Baseline	Follow-up	Difference
LO1	Mean	19.46	18.46	-1.00
	Minimum	.00	.00	
	Maximum	70.00	67.50	
	Std Deviation	12.95087	12.13674	
LO2	Mean	32.06	33.34	+1.28*
	Minimum	.00	.00	
	Maximum	85.00	80.00	
	Std Deviation	13.87114	14.64545	
LO3	Mean	20.06	23.13	+3.07*
	Minimum	.00	.00	
	Maximum	70.00	70.00	
	Std Deviation	13.43199	15.68007	
LO4	Mean	16.84	16.64	-0.20
	Minimum	.00	.00	
	Maximum	70.00	70.00	
	Std Deviation	13.49156	12.35290	

* Significant at the 95% confidence level

Graph 11: Comparison of baseline and follow-up mean scores by LO

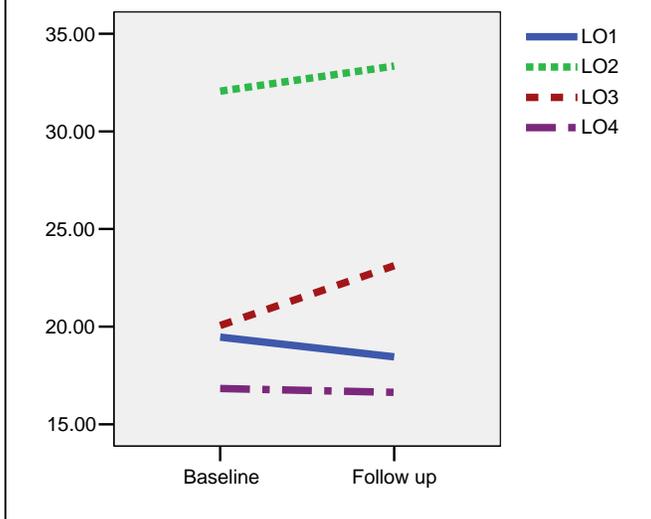


Table 25 and graph 11 show that not much has changed since the baseline:

- LO2 continues to be the greatest strength among Grade 6 learners.
- LO4 continues to be the greatest challenge among Grade 6 learners.

In terms of mean difference, the mean score of LO2 and LO3 in the follow-up study was slightly higher (1.3% and 3.1% respectively) than in the baseline. These differences appear to be marginal (1.3%

and 3.1% respectively) but a test of significance reveals that they are statistically significant. For LO4, there appears to be almost no change between baseline and follow-up studies. There was a marginal drop of 0.2% but this was not statistically significant.

The mean score of Grade 6 learners in the follow-up for LO1 was slightly lower than in the baseline (1%) but this was also not statistically significant.

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 6 were tested on the knowledge and skills of the grade they had just completed or of which they were nearing completion.

The remainder of this section compares the Mathematics follow-up results to those of the baseline for each of the LOs individually. This points to the various strengths and weaknesses among the Grade 6 learners in project schools.

Learning Outcome 1

Table 25 below compares the overall mean percentages achieved by Grade 6 learners in project schools across the different skills in LO1.

Table 25: Comparison of the overall mean percentages for Grade 6 learners in project schools for LO1 skills on the Mathematics test, between baseline and follow-up studies

Testing Phase	Ordering Whole Numbers	Ordering Fractions	Place Value	Rounding Off	Adding or Subtracting Whole Numbers	Multiplying or Dividing Whole Numbers	Fractions, Decimals, Percentage
Baseline	37.96	18.19	27.90	3.35	25.41	21.06	13.40
Follow-up	37.53	18.95	30.80	2.73	23.14	16.12	13.21
Difference	-0.43	+0.76	+2.90	-0.62	-2.27	-4.94	-0.19

The table shows that the strengths and weaknesses of Grade 6 learners in the follow-up study are similar to those of the Grade 7 learners tested in the baseline study. Thus, ordering whole numbers and place value continue to be the skills in which learners scored the highest, while rounding off and operations involving fractions, decimals and percentages continue to be difficult for learners. Also, Grade 6 learners struggled more with multiplication and division of whole numbers and did better on place value than did the Grade 7 learners.

As with the baseline, the mean percentage for LO1 skills in the follow-up study was lower than 40%. This would suggest that the majority of learners in project schools have not sufficiently mastered skills for LO1, which deals with numbers, operations and relationships.

Learning Outcome 2

Table 26 below compares the overall mean percentage achieved by Grade 6 learners in project schools across the different skills in LO2.

Table 26: Comparison of the overall mean percentages for Grade 6 learners in project schools for LO2 skills on the Mathematics test, between baseline and follow-up studies

Testing Phase	Number Patterns	Geometric Patterns	Equations
Baseline	39.10	25.77	24.26
Follow-up	40.53	28.31	24.00
Difference	+1.43	+2.55	-0.26

For LO2, learners in the follow-up study did slightly better on both number patterns and geometric patterns than the Grade 7 learners in the baseline, while equations proved to be a little more difficult for Grade 6 learners. Nevertheless, both learners tested in the baseline and those tested in the follow-up study continue to do better on items dealing with number patterns, and perform less well on equation type questions.

Learning Outcome 3

Table 27 below compares the overall mean percentages achieved by Grade 6 learners in project schools across the different skills in LO3.

Table 27: Comparison of the overall mean percentages for Grade 6 learners in project schools for LO3 skills on the Mathematics test, between baseline and follow-up studies

Testing Phase	2-D Shapes	3-D Objects	Transformation	Perspective
Baseline	27.29	14.23	15.58	24.24
Follow-up	26.65	21.74	17.39	29.86
Difference	-0.64	+7.50	+1.81	+5.62

While the '2-D shapes' skill was a main strength for LO3 in the baseline, the follow-up study showed that the main strength was in perspective-based items. In terms of challenges, items that assessed transformation and 3-D objects are still the main difficulties experienced by Intermediate Phase learners. However, on a positive note, there was a marked improvement (almost 8%) in performance on items that assessed 3-D objects. Improvement was also evident in items assessing perspective (almost 6%).

Learning Outcome 4

Table 28 below compares the overall mean percentages achieved by Grade 6 learners in project schools across the different skills in LO4.

Table 28: Comparison of the overall mean percentages for Grade 6 learners in project schools for LO4 skills on the Mathematics test, between baseline and follow-up studies

Testing Phase	Time	Mass	Capacity	Length
Baseline	23.13	15.42	12.42	18.52
Follow-up	21.28	16.08	13.13	17.69
Difference	-1.85	+0.66	+0.71	-0.83

In comparison to baseline scores, very little has changed in the follow-up study. In addition to the fact that the overall mean score continues to be below 25% across each of the LO4 items, learners are still performing dismally on items that assess mass and capacity.

Again, IEP subcontractors would do well to focus their training intervention on areas where weaknesses have been identified. Therefore, given the poor results in LO1, especially in multiplication and division, fractions and rounding off, more in-depth, subsequent training on other LOs should only take place once the first LO has been satisfactorily addressed.

4. Grade 6 Science

The development of the Science instrument focused on the LOs, Assessment Standards and Core Knowledge and Concepts for Natural Sciences of the NCS. The test focused on scientific investigations (LO1), constructing scientific knowledge (LO2), and Science, environment and society (LO3). A point worth noting is that the JET test does not assess technology related issues. However, JET will be including this area in the Science test in 2006.

Table 29 below compares the mean percentages correct for the Grade 6 learners in project schools on each of the three Science LOs.

Table 29: Comparison of overall test means between baseline and follow-up results on each of the three LOs for Science

Learning Outcome	Testing Period	Mean	Std Deviation	Min	Max
LO1	Baseline	20.73	17.18192	0.00	84.62
	Follow-up	20.81	16.04628	0.00	69.23
	Difference	+0.84			
LO2	Baseline	26.23	17.42390	0.00	76.47
	Follow-up	28.66	17.95963	0.00	82.35
	Difference	+2.43*			
LO3	Baseline	12.47	16.20497	0.00	75.00
	Follow-up	16.64	18.30758	0.00	75.00
	Difference	+4.17*			

* Significant at the 95% confidence level

As with the baseline, LO3 (i.e. Science, society and environment) was answered least well by learners overall in the follow-up study. This LO requires learners to apply knowledge of Science to everyday life. Questions that dealt with LO1 skills (i.e. investigations) were also not answered well by learners. Although the means for LO2 were low, learners performed the best on this LO compared to LO1 and LO3.

As with the Mathematics test, overall mean scores did not exceed the 30% mark. However, there was improvement across all three Science LOs in the follow-up study. The greatest improvement was experienced in LO3, where a mean difference of 4.2% was experienced. Although the overall mean for this LO continues to be very low, the fact that there was an improvement means that some of the needs are being addressed by the project, at least to some extent.

LO2 also showed a statistically significant improvement in its mean score, between the baseline and follow-up studies.

A question-by-question analysis, presented in tables 30 and 31 below, points to some of the Grade 6 learners' strengths and weaknesses.

Table 30: Description of questions in the Grade 6 Science test

Question number	Description of the question
<p>Question 1: Plastic Shopping Bags</p>	<p>The context is set by a diagram and accompanying text. Although learners would probably not have done this particular investigation, the skills being assessed are those that should have been dealt with in class in a generic way. Question 1 (and question 2) relate directly to the Assessment Standards for LO1 of the NCS, as indicated below.</p> <ul style="list-style-type: none"> • Planning an investigation: The first part of this Assessment Standard requires learners to be able to clarify the focus question of an investigation. Clarification of an investigable question does not imply the formulation of an investigable question, therefore question 1.1 only requires learners to identify, from among a number of possible options, the question being investigated, and not to generate their own question in their own words. • Conducts investigations and collects data: This Assessment Standard requires learners to conduct simple tests. The purpose of the question is to assess whether learners understand the purpose of multiple investigations. • Evaluates data: This Assessment Standard requires that learners relate data to the original focus question. Learners need to be able to point to examples that confirm the findings and, by extension, to results that are not possible.
<p>Question 2: Growing Beans</p>	<p>This question is also situated in the Assessment Standards of LO1 as described above. The context is set by a diagram and accompanying text. Although learners probably have not done this particular investigation, the skills that are being assessed are the same as those required for this grade in the NCS. Learners were required to plot a bar graph as one of the tasks in this question.</p>
<p>Question 3: Electricity</p>	<p>This question is located within the LO: <i>Constructing scientific knowledge</i>. Schematic diagrams of three different bulb connections are given. A diagram of a light bulb is given with clear indications of the connecting points. This was done in an attempt to negate possible misunderstandings of the connecting points of a bulb. The question is designed to assess the understanding of a closed circuit and the researchers did not want to cloud the question by requiring an understanding of the internal structure of the bulb or any other distracting features such as bulb holders. This question relates to the core knowledge area of electrical circuits as a system: concept of complete circuit.</p>

Question 4: Materials	This question also falls within the ambit of LO2: <i>Constructing scientific knowledge</i> , and refers to the core knowledge area of temporary and permanent change. The context is set by 'before' and 'after' pictures. The questions refer to chemical and physical change. An example of how to answer the question is given using the burning match scenario.
Question 5: Sun, Earth and Shadows	This question falls within LO2: Constructing scientific knowledge, and focuses on the core knowledge of 'Planet earth and beyond'.
Question 6: Animal Adaptations	This question relates directly to the assessment standards (AS's) for Learning Outcome 3 of the RNCS, i.e. science, society and the environment and the impact that different types of bills and beaks are related to what birds feed on. The context is set by a short description of how birds feed.
Question 7: Plants and Animal	This question relates directly to the assessment standards (AS's) for Learning Outcome 3 of the RNCS, i.e. science, society and the environment and progresses from feeding types to feeding relationships. The question deals with food chains, the interrelatedness of systems and the implications for organisms and society if these systems are disrupted. The arrows depict energy flow within a system.

Table 31: Comparison of overall test means between baseline and follow-up study results on each of the seven questions in the Science test ²²

	Baseline	Follow-up	Difference
Question 1	14.74	13.31	-1.43
Question 2	25.87	27.23	1.36
Question 3	37.66	41.24	3.58
Question 4	46.43	44.47	-1.96
Question 5	1.84	2.39	0.55
Question 6	31.52	32.56	1.04
Question 7	16.11	21.96	5.85

The statistics in table 31 show that Grade 6 learners performed the best on question 4. This would suggest that the learners appeared to be fairly comfortable in answering questions on permanent and temporary changes.

In terms of difficulties, learners struggled the most with questions 1 and 5. The same pattern had emerged in the baseline study findings.

For question 2.2, which required learners to plot a bar graph, many learners were able to plot the graph showing an increase in the number of beans grow in different environments but were not able to get the exact numbers of growing beans and translate this to the graph. A few learners drew pictures of a small bean, a slightly bigger bean and a big bean. This could be because of the pictorial representation on graphs in advertisements. In a few instances learners did not draw anything but simply rewrote the question in the space where the bar graph was supposed to have been drawn.

For questions that required learners to write out an explanation, some learners merely copied the question word for word. Some learners even copied questions from other question numbers. It is possible that language ability may have influenced

²² Refer to Appendix E for mean scores on each of the science test items for project schools

the way learners responded – most learners were tested in English (except in Northern Cape where the test was administered in Afrikaans), which is not necessarily their first language. This is supported by the fact that some learners attempted to answer the question in their home language and not in the language in which the test was administered.

IEP subcontractors should pay particular attention to improving learners' knowledge of basic scientific concepts and how to apply knowledge in the broader context, as well as how to relate data to the original focus question; this should help learners with confirming findings, and by extension, being able to identify cases in which the answer results they get are not feasible.

4. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

As with the baseline study, the researchers structure the following set of conclusions and recommendations around the five research questions:

4.1 How has the overall performance level of Grade 3 learners in IEP and control schools in Numeracy and Literacy changed since the baseline?

Both the baseline findings and the follow-up findings show that most Grade 3 learners continue to perform below the 30% mark.

The IEP target for the end of year 2 (2005) was to achieve a 2% improvement over the baseline phase. Though, this target has not been met in the two Grade 3 LAs in project schools (cohorts 1, 2 and 3), in terms of percentage point difference, control schools experienced bigger drops than project schools.

Learning Area	Group	Baseline result	Follow-up result	% point ²³	% over baseline ²⁴
Grade 3 Numeracy	Project	26%	23%	-3%	-12%
	Control	24%	20%	-4%	-17%
Grade 3 Literacy	Project	42%	40%	-2%	-5%
	Control	46%	37%	-9%	-20%

4.2 How has the overall performance level of Grade 6 learners in IEP and control schools in Mathematics and Science changed since the baseline?

Similarly, Grade 6 learners continue to perform below expected levels in both Mathematics and Science.

The 2% target of improvement in Grade 6 was attained for Mathematics but not for Science. In fact, in terms of Science, very little has changed in project schools since the baseline study. Control schools showed a dramatic drop in their percentage over the baseline in Mathematics (-13%) and to a less extent in Science (-1.5%).

Learning Area	Group	Baseline result	Follow-up result	% point	% over baseline
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²³ This is the actual difference in mean scores between baseline and the follow-up studies.

²⁴ This is the % improvement or drop rate over the baseline study.

Grade 6 Mathematics	Project	22%	22.4%	+0.4%	2%
	Control	23%	20%	-3%	-13%
Grade 6 Science	Project	25.5%	25.3%	-0.2%	-1%
	Control	25.9%	25.5%	-0.4%	-1.5%

4.3 At what grade level are learners in project schools performing?

The results show that at the Grade 3 level, learners are performing two grades below expected levels in Numeracy. In other words, many more learners were able to correctly answer Grade 1 level items than Grade 3 level items. In fact, only 4% of learners in the sample were able to achieve means of 50% or more on the Numeracy test. This is a 0.8% drop since the baseline study. This is worrying because the majority of Grade 3 learners are not coping sufficiently with Grade 3 material.

At the Grade 6 level, almost all learners could not achieve means of 50% or more on Grade 6 level items. Most learners are performing three to four levels below expected curriculum levels.

4.4 How are female learners in project schools performing relative to male learners in the different LAs?

The results show that girls outperformed boys in all LAs, especially in Literacy. In terms of IEP targets, the 2% target improvement over the baseline was reached in Grade 3 Literacy by the girls. In Grade 6 Mathematics, girls experienced a 5% increase over the baseline, while boys dropped by 2%.

Learning Area	Group	Baseline result	Follow-up result	% point ²⁵	% over baseline ²⁶
Grade 3 Numeracy	Female	26%	23%	-3%	-12%
	Male	25%	22%	-3%	-12%
Grade 3 Literacy	Female	43%	44%	+1%	2%
	Male	42%	38%	-4%	-10%
Grade 6 Mathematics	Female	22%	23%	+1%	5%
	Male	22%	21%	-0.5%	-2%
Grade 6 Science	Female	25.7%	25.5%	-0.2%	-1%
	Male	25.3%	25.1%	-0.2%	-1%

4.5 How have learners' performances in LOs and skills for the respective LAs changed since the baseline?

Similar strengths and weaknesses identified in the baseline are evident in the follow-up study.

- **Numeracy:** Counting and addition continue to be the main strengths for Grade 3 learners, while division continues to be the greatest challenge. Contextual type questions were experienced as more difficult than non-contextual or straight arithmetic type questions.
- **Literacy:** Questions that required learners to search and retrieve explicitly stated information from the text showed higher means than questions that required interpretations and evaluations to be made. Generally, learners

²⁵ This is the actual difference in mean scores between the baseline and follow-up studies.

²⁶ This is the % improvement or drop rate over the baseline study.

did not cope very well with questions where the literary genre was not in narrative form (i.e. tables, cartoons, graphs, etc).

- **Mathematics:** As with the baseline study, learners did the best on LO2 type items but struggled with LO4 items, where the means were generally around the 25% mark. In terms of LO1 items, learners continue to struggle with multiplication and division, fractions, and rounding off. For LO2, learners continue to perform the best in number patterns, but struggle with geometric patterns and simple equations. In LO3, transformation was experienced as the greatest challenge. For LO4, measurement (especially mass, capacity and length) is still a problem for learners. Again, learners did better on non-contextual type questions than on contextual items.
- **Science:** Learners continue to do the best on questions relating to permanent and temporary changes but struggled with questions relating to the solar system and natural Sciences.

On the whole, for the follow-up study mean scores were lower than for the baseline study.

A possible contributing factor to why IEP did not meet most of its targets in this Follow up Study 1 may be related to the way the baseline was conducted. As discussed in previous reporting, the IEP baseline testing of grade 3 and 6 learners was originally scheduled to take place in September/October 2004. However, due to a call by the newly appointed Minister of Education to align all privately administered learner tests with the national DoE Systemic Evaluation tests, learner testing could not be conducted until February/March 2005 with the tests to be used revised during the September to February period. As learners were only just a month and half into the school year by February/March 2005, grade 4 and 7 learners were tested to simulate grade 3 and 6 learners at the end of the previous school year. This choice was problematic for three reasons:

- Firstly, by February/March 2005, grade 4 and 7 learners had had approximately two and a half extra months of schooling, including the push for learning that occurs in November of each school year.
- Secondly, it excluded any grade 3 or, particularly, grade 6 learners who were kept back. These learners would have been included if the testing had occurred as originally planned and presumably they would have brought the averages down.
- Lastly, the interval between the February/March 2005 and October/November 2005 testing periods was only seven months, while the targets set for IEP were meant to reflect a year's worth of intervention activities.

At the more general level, contributing, but plausible, factors which may have led to lower follow up scores are that this is a new cohort of learners and their aptitude is lower than that of the learners selected for testing in the baseline study. Also, inadequate Literacy levels (see section 6.2 below) may have contributed to the poor performance, especially in Science and Mathematics. It may also be possible that the cascading model is not working effectively (that master teachers are not effectively transferring knowledge to their cascadees).²⁷

²⁷ It is hoped that this can be verified through the classroom observations of both master teachers and cascaded teachers, which will be done in April 2006.

Nevertheless, the results generally show that IEP learners are doing better than their control counterparts, which shows that the IEP is having a positive, albeit slight, effect in project schools.

However, it is clear from the results discussed in this report that IEP subcontractors need to address more effectively the weaknesses identified in each of the LAs.

4.6 What recommendations can be made on the basis of the follow-up study findings?

4.6.1 Numeracy

The difficulties experienced in Numeracy by Grade 3 learners in project schools in the follow-up study are very similar to those experienced in the baseline study. Subcontractors would do well, therefore, to focus on the basic building blocks of Numeracy (counting, ordering and number representation and addition) before moving on to the more difficult skills (such as subtraction, multiplication and division). It is also recommended that the learners be confronted with more contextually based numerical problems, provided their reading and Literacy levels are stimulated at appropriate levels in the relevant language LAs.

4.6.2 Literacy

It was argued in the baseline report that inadequate Literacy levels of learners may have contributed to poor results in Numeracy, Mathematics and Science. We make the same assertion in this report. However, this may be a loaded statement because learners obtained higher scores on Literacy than they did on the other three Learning Areas. So what does this mean? One explanation is that the knowledge that learners have in Literacy, albeit higher than the other areas, is not sufficient for them to be able to read and understand the questions asked of them in Mathematics and Science. If 50% is a minimum acceptable performance level to go by, the fact that although higher than Numeracy and Mathematics mean scores, the literacy score is also below the required level of performance. But this is not necessarily Literacy at the general level but is possibly the subject specific Literacy knowledge that learners struggle with e.g. specific terms relevant to Mathematics such as 'round off', 'transform', etc or Science such as 'earth's axis', 'revolve', or 'experiment'. Another reason could be that a number of Numeracy / Mathematics questions are contextual in nature, hence the challenge for learners' literacy skills.

Although this study was not tasked with answering this question, if we turn to the theory of mother tongue acquisition, we can see how important language (and Literacy ability) is to learning and teaching. Box 3 below supports the assertion in the previous paragraph that the poor learner performance could be a function of subject specific literacy knowledge, which Barry (1990) refers to as cognitive academic language proficiency (ALP).

Box 3: Importance of language in teaching and learning (see Barry, 1990)

It can be argued that many factors are involved in language acquisition.

According to Cummins (1984) there are two sets of language skills: basic interpersonal communicative skills (BICS) and the cognitive academic language proficiency (CALP). So, for example, we are able to distinguish between the information processing demands of engaging in a casual conversation (BICS) and reading or writing a complex expository text (CALP). He argues that learners will be unable to cope with the school curriculum unless their CALP is sufficiently well developed. A learner's language-cognitive abilities need to be sufficiently well developed to cope with the curricular processes of the classroom. This proficiency should be developed in either the bilingual learner's languages or in both simultaneously. In Cummins's view, CALP involves some universal underlying proficiency that is shared across languages. Once acquired in one language it can be transferred to any other language. Thus CALP acquired in Zulu could be transferred to English medium classes and vice versa.

This theory of skills transfer is supported by research in cognitive science where attempts are made to look for representational schemas for complex narratives in two languages (see Hakuta, 1990).

BICS consists of the visible aspects of language such as pronunciation, basic vocabulary and grammar that allow learners to converse fluently in undemanding everyday situations. **Limited English proficient (LEP) second language learners are not able to demonstrate higher order thinking such as generalising, hypothesising, arguing etc because they lack the CALP required for performing higher cognitive operations through the medium of English** (see NDoE, 1998). Cummins (1986) suggests that the learner with limited English proficiency may need five to seven years to obtain sufficient CALP to perform well on academic tasks, where BICS takes about two years.

If this theory is considered valid by South African policy makers, most L2 learners are unlikely to have acquired the English proficiency to study the type of cognitively demanding, context-reduced subjects they are exposed to in Grade 4, like Mathematics for example. In other words, the LEP learner is faced with a dual educational challenge: mastery of academic content through the medium of a language other than mother tongue. This more often than not manifests itself in poor academic performance.

Therefore, these hypotheses have been interpreted to mean that a solid foundation of mother tongue literacy and subject matter learning would best prepare learners for learning in English. In practice, these notions work against the goals of bilingual education and immersion in English mainstream classrooms for Grade 1 because conceptual development should initially be consolidated in the mother tongue.

This theory is summarised by Cummins' developmental interdependence and threshold hypotheses which respectively suggest that:

- Learning to read in one's mother tongue facilitates reading in a second language
- Children's achievement in the second language depends on the level of mastery in their mother tongue and that the most positive cognitive effects occur when both languages are highly developed (see Cummins, 1976, 1981)

The fact that the scores on the Literacy test at the Grade 3 level, which were written in the mother tongue suggests that learners have not yet developed the full range of proficiency skills in the mother tongue and as a result they cannot, or struggle to, make the jump to English. Hakuta (1990) suggests that Literacy is best developed in the mother tongue when integrated with activities in which the parents can participate; and that knowledge acquired during this period through instruction in the mother tongue will transfer to English. The challenge for IEP is how to address this in their model of skill transfer.

Therefore, on the basis of the findings of both the baseline and follow up study, and the theoretical model summarised above, IEP subcontractors would do well to:

- Get teachers to pay greater attention to exposing learners to different types of text or genres (e.g. tables, cartoons, narratives, etc.), while at the same time developing strategies on how to interact with these different reading texts, identify main ideas, and explain and support their understanding of what they had read. In other words, teachers need to use scaffolding as a methodology in the teaching of reading and writing.
- Assist teachers to spend more time on reading instructions and planning their reading programmes. At the Grade 3 level, the emphasis for the

Grade 3 learner focuses on *learning to read* and once learners have mastery of the reading strategies and skills, the emphasis shifts to *reading to learn*. If the basics on how to read and write are not in place, learners will struggle to learn at subsequent levels and in other LAs; in other words learners will struggle with interpretive and evaluative comprehension.

- Encourage teachers to promote independent reading (e.g. reading at home, as well as in the classroom).
- Suggest that learners do more written work.

In addition to these recommendations, if Literacy levels in the mother tongue are improved, the more improvement is likely to be observed in other Learning Areas such as Mathematics and Science.

4.6.3 Mathematics

For Mathematics, IEP subcontractors would do well to focus their training intervention on areas where weaknesses have been identified. Therefore, given the poor results in LO1, especially in multiplication and division, fractions and rounding off, more in-depth, subsequent training on other LOs should only take place once the first LO has been satisfactorily addressed, as a strong foundation in LO1 is required for other LOs.

4.6.4 Science

Lastly, for Science, IEP subcontractors should pay particular attention to improving learners' knowledge of basic scientific concepts and how to apply knowledge in broader contexts, as well as how to relate data to the original focus question; this should help learners to confirm findings, and by extension, be able to identify cases where the answer results are not feasible.

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APPENDIX A

IEP RESULTS, INDICATORS & TARGETS

Overarching Result: Improve student performance in numeracy, literacy (Grade 3), mathematics and science (Grade 6)

Performance Indicator: Improved student performance in numeracy, literacy, mathematics and science for students in participating schools.

Cohort	Grade	Subject Area	Minimum Targets			
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	3	FP Literacy	None	a) [beginning of the year] establish baseline of data on student performance b) [end of the year] 2% improvement over baseline	5% improvement over baseline None	8% improvement over baseline
		FP Numeracy				
	6	IP Maths				
		IP Science				
4	3	FP Literacy	None	None	Limpopo only: a) [beginning of the year] establish baseline b) [end of year] 2% improvement over baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] 2% improvement over baseline <i>Limpopo only:</i> [end of the year] 5% improvement over baseline
		FP Numeracy				
	6	IP Maths				
		IP Science				

Result 1: Increased subject matter knowledge for teachers in the targeted subject areas.

Performance Indicator: Performance of teachers that have improved subject matter knowledge in (a) numeracy and literacy (Grade 3), and (b) mathematics and science (Grades 6) in all four focus provinces

Cohort	Grade	Subject Area	Minimum Targets			
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	3	FP Literacy	Number of teachers trained disaggregated by gender	a) [beginning of the year] establish baseline on teachers' subject knowledge b) [end of the year] 5% improvement over baseline	10% improvement over baseline	15% improvement over baseline
		FP Numeracy				
	6	IP Maths				
		IP Science				
4	3	FP Literacy	None	None	<i> Limpopo only:</i> a) [beginning of the year] establish baseline b) [end of year] 5% improvement over baseline	<i> Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] 5% improvement over baseline <i> Limpopo only:</i> [end of the year] 10% improvement over baseline
		FP Numeracy				
	6	IP Maths				
		IP Science				

Result 2: Improved ability of teachers to develop and apply continuous assessment strategies and techniques

Performance Indicator: Percentage of teachers that have documentation in place, reflecting continuous assessment of students' performance in numeracy, literacy, mathematics and science in participating schools

Cohort	Grade	Subject Area	Minimum Targets			
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	3	FP Literacy	Number of teachers trained disaggregated by gender	a) [beginning of the year] establish baseline on teachers' ability in continuous assessment b) [end of the year] 8% improvement over baseline c) [end of year] establish new baseline using improved instruments (classroom observation based)	8% improvement over baseline	15% improvement over baseline
		FP Numeracy				
	6	IP Maths				
	IP Science					
4	3	FP Literacy	None	None	<i>Limpopo only:</i> a) [beginning of the year] establish baseline b) [end of year] 8% improvement over baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] 8% improvement over baseline <i>Limpopo only:</i> [end of the year] 15% improvement over baseline
		FP Numeracy				
	6	IP Maths				
	IP Science					

Result 3: Increased number of teachers being trained (in-service) and new teachers trained (pre-service)

Performance Indicator: Number of teachers trained and have successfully completed training through: (a) in-service and (b) pre-service programs, disaggregated by gender

Type of Training	Minimum Targets			
	Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
In-service	None	Number of teachers trained disaggregated by gender – all provinces	Number of teachers trained disaggregated by gender – all provinces	Number of teachers trained disaggregated by gender – all provinces
Pre-service	None	None	None	Number of teachers trained disaggregated by gender – 465 in total registered: 414 registered in two-year program and 51 is three-year program. Of those who complete a two-year program in 2007, it is estimated that 70% or (292) will successfully complete their program or graduate.

NOTE: These numbers are not static as it is expected that some teachers will drop out and possibly others will be added (if funds allow). RTI is therefore required to continuously update these numbers and inform USAID about the changes.

Result 4: Increased number of teachers that are teaching literacy, numeracy, mathematics and science in a manner consistent with the RNCS

Performance Indicator: Percentage of teachers that are using student-centered teaching methods to implement the Revised National Curriculum Statement (RNCS) in their classrooms.

Cohort	Grade	Subject Area	Minimum Targets				
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007	
1,2,3	3	FP Literacy	Number of teachers trained disaggregated by gender	a) [beginning of the year] establish baseline on teachers' ability to implement RNCS	20% improvement over baseline	35% improvement over baseline	
		FP Numeracy		b) [end of the year] 20% improvement over baseline			
	6	IP Maths		c) establish new baseline using improved instruments (classroom observation based)			
		IP Science					
4	3	FP Literacy	None	None	<i>Limpopo only:</i> a) [beginning of the year] establish baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline	
		FP Numeracy					b) [end of year] 20% improvement over baseline
	6	IP Maths					<i>Limpopo only:</i> [end of the year] 35% improvement over baseline

Result 5: Improved teachers' ability to develop and use classroom materials that support C2005 learner-centered instruction

Performance Indicator: Percentage of teachers in participating schools who are developing and using teacher-created classroom materials utilizing reference materials, including textbooks.

Cohort	Grade	Subject Area	Minimum Targets			
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	3	FP Literacy	Number of teachers trained disaggregated by gender	a) [beginning of the year] establish baseline on teachers' ability to develop and use classroom materials b) [end of the year] 8% improvement over baseline c) establish new baseline using improved instruments (classroom observation based)	8% improvement over baseline	15% improvement over baseline
		FP Numeracy				
	6	IP Maths				
	IP Science					

Cohort	Grade	Subject Area	Minimum Targets			
			Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
	3	FP Literacy	None	None	<i>Limpopo only:</i> a) [beginning of the year] establish baseline b) [end of year] 8% improvement over baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] 8% improvement over baseline <i>Limpopo only:</i> [end of the year] 15% improvement over baseline
		FP Numeracy				
	6	IP Maths				
		IP Science				

Result 6: Improved instructional leadership skills for School Management Teams (SMTs)

Performance Indicator: Percentage of schools where School Management Teams (SMTs) demonstrate improved instructional leadership skills

Cohort	Minimum Targets			
	Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	None	Establish baseline using new and improved instruments	15% improvement over baseline	25% improvement over baseline
4	None	None	<i>Limpopo only:</i> a) [beginning of the year] establish baseline b) [end of year] 15% improvement over baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] 15% improvement over baseline <i>Limpopo only:</i> [end of the year] 25% improvement over baseline.

Result 7: Improved management and administrative capacity of schools to collaborate with School Governing Bodies (SGBs) and communities to develop and effectively implement School Development Plans (SDPs) to improve school functionality

Performance Indicator: Increased percentage of schools that (a) develop and (b) effectively implement three-year SDPs in collaboration with SGBs.

Cohort	Minimum Targets			
	Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
1,2,3	None	Establish baseline using new and improved instruments	a) Plan development: 25% improvement over baseline b) Plan implementation: 10% improvement over baseline	a) Plan development: 40% improvement over baseline b) Plan implementation: 35% improvement over baseline
4	None	None	<i>Limpopo only:</i> a) [beginning of the year] establish baseline b) [end of year] Plan development: 25% improvement over baseline c) Plan implementation: 10% improvement over baseline	<i>Other provinces</i> a) [beginning of the year] establish baseline b) [end of the year] Plan development: 25% improvement over baseline c) Plan implementation: 10% improvement over baseline <i>Limpopo only:</i> a) Plan Development: 40% improvement over baseline b) Plan implementation: 35% improvement over baseline

Results 8: Improved district * capacity to develop and effectively implement a strategic plan for school support.

Performance Indicator: Number of districts (a) that have in place strategic plans to support schools and (b) that are effectively implementing those plans

Minimum Targets			
Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
None	Establish baseline using new and improved instruments	a) Plan development: 33% of the participating districts/circuits b) Plan implementation: 15% of the participating districts/circuits	a) Plan development: 66% of the participating districts/circuits b) Plan implementation: 50% of the participating districts/circuits

*Can involve district, circuit and/ or ward level (dependent on the province)

Result 9: Support to national DoE.

Minimum Targets			
Year 1: 2004	Year 2: 2005	Year 3: 2006	Year 4: 2007
None	Customer satisfaction with TA provided to DoE: $\geq 80\%$	Customer satisfaction with TA provided to DoE: $\geq 80\%$	Customer satisfaction with TA provided to DoE: $\geq 80\%$

APPENDIX B

TEST ADMINISTRATION MANUAL



JET EDUCATION
SERVICES

*TRAINING MANUAL FOR THE
ADMINISTRATION OF THE GRADE 3
LITERACY
AND NUMERACY INSTRUMENTS AND THE
GRADE 6 SCIENCE AND MATHEMATICS
INSTRUMENTS FOR THE MAIN STUDY OF
THE INTEGRATED EDUCATION
PROGRAMME (IEP) FUNDED BY USAID*

TABLE OF CONTENTS

1. INTRODUCTION	12
1.1 BACKGROUND	12
1.2 PURPOSE OF THIS MANUAL	12
1.3 GENERAL CONDITIONS.....	12
1.4 NUMBERS AND INSTRUMENTS	13
1.4.1 Grade 3 Instruments (Numeracy and Literacy)	13
1.4.2. Grade 6 Instruments (Mathematics and Science)	14
2. PREPARATION TO ADMINISTER THE TESTS.....	14
2.1 PREPARATION BEFORE GOING TO SAMPLE IEP AND NON-IEP CONTROL SCHOOLS.....	14
2.2 PREPARATION WHEN ARRIVING AT THE SCHOOLS.....	16
2.2.1 <i>The SAMPLING Process: Instructions on How to Sample Learners Effectively</i>	16
2.3 COMPLETION OF FORMS (POST TESTING).....	22
2.3.1 <i>Form A: Learner Tracking Form</i>	22
2.3.2. <i>Form B: Test Administration Form</i>	23
2.3.3. <i>Form C: Time Report</i>	23
2.3.4. <i>Form D: Travel Log Sheet</i>	24
2.3.5. <i>Form E: Iep Claim Form</i>	25
2.3.6. <i>Form F: School Codes And Check List</i>	25
3. GENERAL INSTRUCTIONS FOR INVIGILATING.....	26
3.1 INTRODUCTION.....	26
3.2 VENUE	26
3.2 MATERIAL REQUIRED	26
3.2.1 <i>By the test administrator/ fieldworker</i>	26
3.2.2 <i>By each learner</i>	27
3.4 TIME MANAGEMENT	27
4. ADMINISTERING THE INSTRUMENT.....	28
4.1 GENERAL.....	28
4.2 INTRODUCING THE PROCEDURE	29
4.3 HANDING OUT OF THE TEST BOOKLETS.....	29
4.4 COMPLETING OF LEARNER'S PARTICULARS ON THE BOOKLET	29
4.5 WRITING THE TEST	30

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 are currently in grade 3, two instruments (the Grade 3 numeracy test and the Grade 3 literacy test) are to be administered to learners in both the 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 3 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 results measurement study:

1. 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
2. It is crucial that the same learners who were selected to write the first test (numeracy test) write the second test (literacy test). **DO NOT ALLOW**

LEARNERS WHO DID NOT WRITE IN THE FIRST TESTING SESSION TO PARTICIPATE IN THE SECOND SESSION OF TESTING. To assist you to keep track of who writes the tests, please complete Form A. This form requires you to list all the names and relevant details of the learners who wrote the test.

- If you are uncertain of how to complete this form, ask the JET coordinator.

1.4.2. Grade 6 Instruments (Mathematics and Science)

For learners who are currently in grade 6, two instruments (the Grade 6 mathematics test and the Grade 6 science test) are to be administered to learners in both the 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 6 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 is English. However, a few schools in the sample IEP and non-IEP control schools are using Afrikaans at this level (i.e. Northern Cape schools).

The administrator of the grade 6 instruments is to note the following for the results measurement study:

- 1 It is crucial that the same learners who were selected to write the first test (mathematics test) write the second test (science test). **DO NOT ALLOW LEARNERS WHO DID NOT WRITE IN THE FIRST TESTING SESSION TO PARTICIPATE IN THE SECOND SESSION OF TESTING.** To assist you to keep track of who writes the tests, please complete Form A. This form requires you to list all the names and relevant details of the learners who wrote the test. Please refer to **FORM A** in this manual for instructions on how to complete this form.

- If you are uncertain of how to complete this form, ask the JET coordinator.

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 results measurement 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 3 learners doing the Grade 3 instruments are to be tested in one classroom at the school, while Grade 6 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/cargo all materials back to Gauteng or will drive back to Gauteng transporting all the materials for data capture and analysis.

2.2 Preparation when arriving at the schools

Make sure you arrive at the school at least an hour to 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

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 IEP and non-IEP control school, you will use the following “sampling technique”:

NOTE 1: Before you begin the sampling process, any learners who are repeating the grade **MUST** be **EXCLUDED**.

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.

Total Number of BOYS for the Sample

(i) Total Number of Boys in the Grade ÷ Total Number of Learners in the Grade

$$= 41 \div 96$$

$$= 0.42 \quad (\text{round off to } 0.4)$$

(ii) Answer above x Total Number of Learners to be Tested

$$= 0.4 \times 25$$

$$= 10$$

THEREFORE **10 BOYS** need to be selected for the sample

STEP A (above). The answer is 4.1. This number must be rounded off to 4 - the nearest integer. This means every fourth boy must be selected. Therefore, select boys 4, 8 12, 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.

Interval for Selecting BOYS for the Sample

= Total Number of Boys in the Grade ÷ Answer of Step A above

$$= 41 \div 10$$

$$= 4.1 \quad (\text{Note: Answer is to be rounded off to nearest integer})$$

$$= 4$$

THEREFORE every 4th boy will be selected for the sample until you have 12 boys.

THUS, select boys 4, 8 12, 16, 20, 24, 28, 32, 36, 40.

Step 3: Getting the number 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

(i) Total Number of Girls in the Grade ÷ Total Number of Learners in the Grade

$$= 56 \div 96$$

$$= 0.58 \quad (\text{round off to } 0.6)$$

(ii) Answer above x Total Number of Learners to be Tested

$$= 0.6 \times 25$$

$$= 15$$

THEREFORE **15 GIRLS** need to be selected 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 integer. This means every fourth girl must be selected. Select girls 4, 8 12, 16, 20, 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

$$= 56 \div 15$$

$$= 3.73 \quad (\text{Note: Answer is to be rounded off to nearest integer})$$

$$= 4$$

THEREFORE **every 4th girl** will be selected for the sample until you have 15 girls.

THUS, select boys 4, 8 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 1.

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 the result to the nearest integer, which is 13 in this instance. **This means 13 boys have to be drawn from the grade.**

A.

Total Number of BOYS for the Sample

(i) Total Number of Boys in the Grade ÷ Total Number of Learners in the Grade

$$\begin{aligned} &= 101 \div 186 \\ &= 0.45 \quad (\text{round off to } 0.5) \end{aligned}$$

(ii) Answer above x Total Number of Learners to be Tested

$$\begin{aligned} &= 0.5 \times 25 \\ &= 12.5 \quad (\text{Note: Answer is to be rounded off to nearest integer therefore } 13) \end{aligned}$$

THEREFORE **13 BOYS** need to be selected for the sample

nearest integer. This means every eighth boy must be selected. Therefore, select boys 8, 16, 24, 32, 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.

Interval for Selecting BOYS for the Sample

$$\begin{aligned} &= \text{Total Number of Boys in the Grade} \div \text{Answer of Step A above} \\ &= 101 \div 13 \\ &= 7.7 \quad (\text{Note: Answer is to be rounded off to nearest integer}) \\ &= 8 \end{aligned}$$

THEREFORE **every 8th boy** will be selected for the sample until you have 13 boys.

THUS, select boys 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 3.

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

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.

Total Number of GIRLS for the Sample

(i) Total Number of Girls in the Grade ÷ Total Number of Learners in the Grade

$$= 85 \div 186$$

$$= 0.45 \text{ (Note: Answer is to be rounded off to nearest integer)}$$

$$= 0.5$$

(ii) Answer above x Total Number of Learners to be Tested

$$= 0.5 \times 25$$

$$= 12.5 \text{ (but this needs to be rounded off to the nearest integer)}$$

$$= 13$$

BEFORE CONTINUING, CHECK TOTAL NUMBER OF LEARNERS SELECTED FOR TESTING

$$= 25$$

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

In this instance, we get a total of 26 and not 25 as required. When this happens, you will need to reduce the sample by 1 learner (i.e., 26 minus 25 = 1). In this case, because the total grade is made up of more boys than girls (101 boys as opposed to 85 girls), you should reduce the number of girls

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 7.0. This number must be rounded off to 7 - the nearest integer. This means every seventh girl must be selected. Select girls 7, 14, 21, 28, 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

$$= \text{Total Number of Girls in the Grade} \div \text{Answer of Step A above}$$

$$= 85 \div 12$$

$$= 7.0 \text{ (Note: Answer is to be rounded off to nearest integer)}$$

$$= 7$$

THEREFORE every 7th girl will be selected for the sample until you have 12 girls.

THUS, select girls 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84.

What to do? (The calculated number of learners to be sampled is 1 learner more than the required number of 30 learners)

What to do? (Learner numbers are low):

If there are **few** learners in the 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 30):

If there are **just over** 30 learners in each grade (i.e., 26 - 30 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, i.e., 27 assuming that in existing instruments all pages in the instrument are provided. If there are any defects in the core set of 25 instruments, the 2 spare copies provided for the school are to be used to correct any printing defects, before any further learners, over and above the standard 25, are invited to write the instrument as well).

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

SCHOOL:

INSTRUMENT	CLASSROOM 1 (Grade 3 learners)	CLASSROOM 2 (Grade 6 learners)	TOTAL
Numeracy Grade 3	25	/	25
Literacy Grade 3			
Maths Grade 6	/	25	25
Literacy Grade 6			

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 Completion of forms (post testing)

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. These are:

2.3.1 FORM A: LEARNER TRACKING FORM

In view of the fact that during the previous IEP testing round, there were more learners in the second seating than in the first, we felt it necessary to control this by getting researchers/test administrators to complete a learner tracking form which will be part of each school package for use by researchers after the first testing session and before the start of the second testing session.

See copies of this form (Form A) at the back of this manual. Your provincial coordinator in the training session for test administrators will go over this form and ensure that requirements for its completion at each school are fully understood.

*This form (Columns 1 – 12) should be filled in by the test administrator in full **BEFORE LEAVING THE SCHOOL**. In some instances, information can be collected from learners, while in other instances you can collect the information from educators at the school. Collect information as needed.*

Fieldworkers are to note the following instructions (refer to Form A at the back of the manual):

- *This form needs to be completed for every school visited.*
- *Columns 1, 2, 3, 5 and 6 in this form must be completed **AFTER** the learners complete the **FIRST TESTING SESSION** using the information given by learners on the cover page of the test booklets (**Use the break between sessions to complete this part of the form by referring to the collected tests**).*
- *Mark with a tick in Column 7 if you administered tests to grade 3 learners or Column 9 if you administered tests to grade 6 learners.*
- *At the start of the **SECOND TESTING SESSION**, fieldworkers need to do a roll call to check that all the learners who participated in the first testing session are present at the second seating. Mark with a tick in Column 8 if you administered tests to grade 3 learners or column 10 if you administered tests to grade 6 learners. Any learners who are not present need to be marked with a cross.*
- ***NO NEW ADDITIONS** to the sample at the start of the second session are to be allowed.*
- *You can collect information for Columns 4, 11, 12 and 13 from respective learners at the end of the first testing session / when you are doing the roll call at the start of the second testing session / or you can get it from educators if they are willing to cooperate.*

- *Please transfer the learner code on this form to the respective learner tests. Please note that the **same learner who wrote in session 1 will be given exactly the same code for session 2.** Do not assign the same code for another learner in the second testing session.*
- *Provide any comments at the end of the form.*
- *IF you have any problems filling this form, please consult your provincial co-ordinator. In some instances, the provincial co-ordinator may be on site with you for quality assurance purposes. If the provincial co-ordinator is at another site, you may have to call the provincial co-ordinator by phone (refer to the relevant cell numbers provided earlier for the provincial co-ordinators of each province).*

2.3.2. FORM B: TEST ADMINISTRATION FORM

To monitor the test administration process, you will need to complete form B. This form needs to be completed for every school visited. There are 16 questions in total. Please answer all questions

See copies of this form (Form B) at the back of this manual. Your provincial coordinator in the training session for test administrators will go over this form and ensure that requirements are fully understood.

IF you have any problems filling this form, please consult your provincial coordinator

2.3.3. FORM C: TIME REPORT

According to USAID policy, it is essential that you keep a timesheet of work done on the project. See form B attached to the manual. Your provincial coordinator in the training session for test administrators in your province will go over this form and ensure that requirements are fully understood.

Fieldworkers are to note of the following instructions (refer to Form C at the back of the manual):

- *There are four main activities that you will be engaged in:*
 - *Traveling;*
 - *Training;*
 - *Test administration; and*
 - *Filling in of forms to the satisfaction of JET Education Services.*
- *You are required to record the number of hours spent on each of these activities on a **DAILY BASIS.***

- This form also requires you to indicate the names of the schools visited and the dates that they were visited. Provide comments when necessary.

Please note that although this form requires you to keep track of the number of HOURS spent on the different activities, you will be **paid a DAILY rate** (as stipulated in your contract). In other words, the test administration rate includes traveling time and time spent on the filling in of forms. Thus, when claiming days worked on the claim form (FORM C in this manual), you should indicate whole days (not hours) e.g., 1 day for test administration, traveling to the scheduled IEP or non-IEP school on a given day and back to your accommodation venue (if required), as well as the filling in of any forms). Please remember to sign the form before you submit the form to your provincial coordinator at the end of the test administration process in your province.

If you have any difficulty completing this form, please contact your provincial coordinator.

2.3.4. FORM D: TRAVEL LOG SHEET

Because of the extensive traveling time that is required of fieldworkers in some provinces, where the IEP districts and schools are found in remote rural areas, it is crucial to keep records of all details that relate to travel and expenditure. To assist you in this process, you will need to complete a Travel Claim Form (Form D in this manual). Your provincial coordinator in the training session for test administrators will go over this form and ensure that requirements are fully understood.

Fieldworkers are to note the following instructions (refer to Form C at the back of the manual):

- As with other forms for completion, this form must be completed on a **DAILY BASIS**.
- Every trip must be recorded. Please treat return trips to accommodation as separate from the trips to schools. Thus, you will record the travel details of your leaving the accommodation to go to school X in one row on the form. When you leave the school to go back to the accommodation venue, or your next accommodation venue, you should record this in the next row. Please ensure that you complete the odometer meter reading and the kilometres travelled per trip.
- If you are using your **own vehicle**, any kilometres travelled in your car will be **reimbursed at R2.20**. The travel claim form allows you to note how much is owed to you in this regard (e.g., if the total number of kms travelled on trip1 of day 1 is 100km, this should be multiplied by R2.20 = which will give you an amount of R220 to be claimed for this portion of work). Note, that this amount will cover any petrol expenses incurred along the way. In other words, you cannot claim for both kms travelled and petrol expenditure when using your own car.
- If you are using a **hired vehicle**, you will not be reimbursed for any kilometres travelled. You should still note the number of kms travelled in the form but you do not need to complete the column titled: " IF USING OWN VEHICLE ". However, any **petrol** expenses incurred will be **reimbursed**, provided you keep and submit your original petrol slips.

- *Please ensure that both you and your provincial coordinator sign this form before you submit it with your claim and the relevant, original receipts (all receipts should be clustered by category, so for example, all petrol should be pasted on a blank page face up, all toll fees should be pasted on a separate blank page, face up, etc. as original documentation to support your claim).*
- *If travelling by **public transport** to the training venue, taxi expenses will be reimbursed. Where possible, a signed receipt of payment from the taxi operator is requested and this receipt should indicate the cost of the fare, the date of travel, the signature of the taxi operator and the details of the trip itself (e.g. trip from Durban to Empangeni). Please note the amount in the travel log sheet in the appropriate column and attach supporting documentation, where possible.*
- *IF you have any difficulty completing this form, please contact your provincial coordinator.*

2.3.5. FORM E: IEP CLAIM FORM

Using the other forms, please fill in totals in the claim form. Remember to fill in your personal details on the last page of this claim form. See copies of this form (Form E) at the back of this manual. Your provincial coordinator in the training session for test administrators will go over this form and ensure that requirements are fully understood.

Please ensure that both you and your provincial coordinator sign this form before you submit it with your claim and relevant receipts.

IF you have any problems filling this form, please consult your provincial coordinator for assistance. In the first round of test administration, understanding that test administrators were unemployed, JET Education Services was lenient with claims to ensure that administrators were paid promptly. This round *only full* claims will be paid.

While all 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 any expenses incurred, if receipts have been lost.

2.3.6. FORM F: SCHOOL CODES AND CHECK LIST

We have also provided at the back of this manual a list of schools and associated school codes. Use this form to fill in the required details (i.e., on each of the learner tests, forms, etc). Refer to Form F in this manual.

You will also need to record the number of completed tests per school and grade. This is to ensure that no tests go missing while in the field.

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 with a JET appointed provincial coordinator/quality assurer, 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 or educators 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);
- ✓ At least, 1 pencil sharpener to have on hand for learners if their pencils break (in some instances, schools will be able to assist with the provision of pencils, sharpeners and erasers for learners from their stationary storeroom, if this is the case, as administrator you will be required to distribute these to learners and then collect all supplies provided by the school to return these to the school, before leaving);
- ✓ At least 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) to assist with your calculations in relation to randomly sampling learners strictly following the method outlined above (Note that no learners are to use calculators when completing the instruments);

- ✓ Any forms that are to be completed after test administration session(s) (e.g., during breaks or after the testing sessions have been completed – at home or at your accommodation venue, in the afternoon, for example). Ensure that you do not leave the school without completing information that requires questioning of either educators and/or learners at the school.

3.2.2 By each learner

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

Note 1: 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. Do not encourage learners to erase their calculations on spare paper or on the back of blank pages in the instrument. This is useful information for the researcher analyzing all aspects of learners' performance in relation to these instruments).

Note 2: Please ensure that learners do not use calculators for any calculations, as the instruments are testing not whether learners can use calculators, but whether they can apply mathematical principles, concepts, etc. to perform particular categories of task appropriate to their grade level, independently and unaided.

LEARNERS ARE, THEREFORE, NOT ALLOWED TO USE CALCULATORS.

3.4 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 allocated time limits. 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). It is useful to write this information on the chalkboard, if there is one in the room where learners are being tested (in this case, ensure that chalk is available in the classroom, before the test administration process begins).

Test Numeracy first with Grade 3 learners. At the same time, the Grade 6 Mathematics test with Grade 6 learners will start in a nearby classroom at the school. This session will be conducted by your co-test administrator in the same team as yourself.

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

A team of two fieldworkers will go to a school. One fieldworker should be the designated administrator for the Grade 3 learners and the other for the Grade 6 learners. Who does what can be decided in conjunction with your provincial coordinator at the test administration training session.

If only one fieldworker goes to a school, then ask one district official or as a last resort a teacher to assist you to administer the tests across the different grades (In most instances, this additional kind of assistance should not be required. If it is, because of some unforeseen circumstance, ensure that the assisting educator or district official does not take a copy of the instrument away. Remember, you must ensure the integrity and confidentiality of all instruments and a `leak` would compromise the data that is collected now and in the future). 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. It is acceptable, however, if an educator or you, as test administrator, point out to a learner that on the cover page of the instrument they have forgotten to fill out their name or their gender or their school's name (i.e., the kind of details which help us to track who has completed instruments, when and where).

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 and not to deviate from these procedures.

After an invigilation session, ensure that educators do not retain any copies of the JET instruments. As indicated above, 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. If learners are at ease, they are likely to perform better. We want to see learners perform to their optimum potential. They should not, therefore, be stressed by the testing opportunity. An additional factor, which may help them to not feel stressed is knowing that their results will not be used in anyway towards their final school report.

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. Understand that many learners may not have been exposed to a variety of testing/questioning methods. Encourage learners to follow instructions carefully, such that if for a multiple choice question they are asked to circle the correct option, then stress that this does in fact

mean 'circle' the option (i.e., not rewrite it, or cancel it out, etc.). Following instructions carefully will help the markers scoring their work score accurately.

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 and draw a circle around the right answer.** (*Show this on the chalk board - prepare an example question in advance for this purpose, i.e., an example that is not difficult and which does not repeat a question in the instrument that learners will respond to. An easy example, that is clearly laid out and that learners can respond to quite easily before writing the instrument themselves will help to build learners' confidence in their own abilities*). **Remember, there is only one correct answer to each multiple choice question** (*noting that in the science instrument for Grade 6 learners, there are a few closed questions where learners are required to tick applicable possibilities – in the same vein then, it is useful for the test administrator giving out this instrument to provide an example of this kind of question – your provincial coordinator in the training session will discuss the differences between these two types of questions in your training session before the test administration process begins in the identified schools in your province*).
- 🗣️ **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 (face all learners, starting at the back of the room walking backwards to ensure that you keep all learners in sight, so that once all learners have an instrument they can turn the instrument over at the same time).

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 page is filled out correctly and in full.

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' (You may want to draw a stick picture of a girl on the board and draw a stick picture of a boy on the board to assist learners here. As this assistance to learners is only for completing the cover page, you can even write the word 'girl' or the word 'boy' next to the appropriate stick picture, so that learners don't get 'stuck' on an item for completion that is not being tested, but is being used for our information and descriptive statistics/analyses purposes).
- 👤 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 to help 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? (pause and allow the learners to respond) 'Three'. Draw a circle around the letter B next to the number 'three'.
- 👤 Do you understand?
- 👤 You can use the 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*) (*In this instance, indicate to the learner that they are required to tick the one valid answer only. Sensitise them to the fact that in other parts of the same instrument they may find that they are asked to select / tick all valid/correct answers. Emphasize that they must read instructions carefully to make this distinction in relation to what is required*):

E.G. What kind of animal is an elephant?

(Tick ONE box)

Mammal

Reptile

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 allocated 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. Pile each set together. Put the test material back into the box that you brought the instruments in (Note: these boxes are to be kept in good condition as these boxes will be used to cargo/courier instruments back to GAUTENG where the instruments will be data captured and analysed – keep the instruments for one school separate from the instruments used in other schools).

*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!

FORM A

(Complete 1 per school)

LEARNER TRACKING FORM FOR THE IEP STUDY

Date _____

School code _____

Name of the school _____

Name of fieldworker _____

Grades tested _____

This form (Columns 1 – 12) should be filled in by the test administrator in full **BEFORE LEAVING THE SCHOOL**. In some instances, information can be collected from learners while in other instances you can collect the information from educators at the school. Collect information as needed.

NB:

- Columns 1, 2, 3, 5 and 6 in this form must be completed **AFTER** the learners complete the **FIRST TESTING SESSION** using the information given by learners on the cover page of the test booklet (**Use the break between sessions to complete this part of the form**).
- Mark with a tick in Column 7 if you administered tests to grade 3 learners or Column 9 if you administered tests to grade 6 learners.
- At the start of the **SECOND TESTING SESSION**, fieldworkers need to do a roll call to check that all the learners who participated in the first testing session are present at the second seating. Mark with a tick in Column 8 if you administered tests to grade 3 learners or column 10 if you administered tests to grade 6 learners. Any learners who are not present need to be marked with a cross.
 - **NO NEW ADDITIONS** to the sample at the start of the second session are to be allowed.
 - You can collect information for Columns 4, 11, 12 and 13 from respective learners at the end of the first testing session / when you are doing the roll call at the start of the second testing session / or you can get it from educators if they are willing to cooperate.
 - Please transfer the learner code on this form to the respective learner tests. Please note that the **same learner who wrote in session 1 will be given exactly the same code for session 2**. Do not assign the same code for another learner in the second testing session.
 - Provide any comments at the end of the form.

Learner Nr.	1	2	3	4	5	6	7		8		9	10	11	12	13
	Surname	First name	Grade	Class	Gender	Age	Present for first testing session		Present for second testing session		Registration Teacher Name	Teacher Name: Lang/Sci	Teacher Name: Num/Maths		
						Gr3 Numeracy	Gr6 Maths	Gr3 Literacy	Gr6 Science						
01															
02															
03															
04															
05															
06															
07															
08															
09															
10															
11															
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16															
17															
18															
19															
20															
21															
22															
23															
24															
25															

FORM B

(Complete 1 form for each Learning Area per grade)

TEST ADMINISTRATION FORM FOR THE IEP STUDY

Complete one form for each Learning Area per Grade

1. School identification code: _____
2. School name: _____
3. Grade: _____
4. Learning Area: _____
5. Test Administrator: _____
6. Date of testing: _____

Actual schedule of the testing sessions		
7.1.	Arrival time	
7.2.	Time left school	

8. Were there any special circumstances or unusual events during the session?
[] - No [] - Yes - Explain:

9. Did students have any particular problems with the testing (e.g. tests too difficult, problems with language (note which words), not enough time provided, too much time provided, tiring, confusing)?
[] - No [] - Yes - Explain:

10. Were there any problems with the testing materials (for example, incorrect test booklet assignments, insufficient booklets)?
[] - No [] - Yes - Explain:

11. Were there any problems with the testing venue arrangement (e.g., not enough chairs

available, noise, etc.)?

- No

- Yes - Explain:

12. Did any of the teachers interfere with the test administration process? If yes, how did you deal with this?

- No

- Yes - Explain:

13. a) Did a district official come to the school to monitor at the school?

- No

- Yes – **please specify name of official**

13. b) If yes, please explain what activities / support was provided during his/her visit

- No

- Yes

14. a) Did a JET person quality assurer visit the school on the day of testing?

- No

- Yes – **please specify name of JET person**

14. b) If yes, please explain what activities / support was provided during his/her visit

- No

- Yes

FORM D

(Complete daily in the test administration period including the training day in your province)

Integrated Education Program (IEP) Time Report: Result 0

Subcontractor : JET Education Services
Province : _____
First Name : _____
Surname : _____
Month starting : _____
Month ending : _____

Activity	Date															
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th
Traveling																
Training																
Test administration																
Filling in forms																
Total Hours																

Activity	Date															Total Hours
	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st	
Traveling																
Training																
Test administration																
Filling in forms																
Total Hours																

Please indicate the names of schools which you visited and the dates that they were visited

Name of school	Date visited	General comments

- Notes:
1. The test administration rate includes travelling time
 2. Please complete this form on a daily basis while in the field
 3. When claiming days worked on the "IEP Project Claim Form", indicate whole days worked (e.g. 1 day for test administration and travel to site X)

Fieldworker Signature: _____

FORM E

(Complete at the end of the test administration period, consolidating your full claim for the test administration period, including the training day)

IEP PROJECT

FIELDWORKER CLAIM FORM

Invoice To:

THE PROJECT MANAGER

JET EDUCATION SERVICES

23 JORISSEN STREET 3RD FLOOR, BRAAMFONTEIN CENTRE

BRAAMFONTEIN

From:

NAME	
ID	
Province Worked	
Period	

Total days worked	PROFESSIONAL FEE		PER DIEM		COMMUNICATION	TRAVEL REIMBURSEMENT (if using own car)			Total Petrol	Total Toll fees	Total Taxi fare
	Daily Rate	Total Professional Fee	Per Diem Rate	Total Per Diem	Total Cellphone costs (if applicable)	Rate Per Km	Total Kms Travelled	Total Amount claimed per Km			
	R400	R	R60	R	R	R2.20	km	R	R	R	R

Total Advances/Allowance(s)	R
Total Due After Advances Deducted	R

NOTES:

1. Total Professional fees will be taxed at 25%
2. For communications (cell phone costs), a maximum of R55 per week can be invoiced
3. If you are using your own vehicle you may claim for kilometres and not for petrol. If you are using a hire car, no kilometres will be reimbursed, only petrol.
4. PLEASE ATTACH ANY AND ALL RECIEPTS RELEVANT TO THIS PROJECT (especially for petrol and toll fees).
5. Any unused funds which were advanced need to be returned to JET or will be off set against your claimed amount.

Personal Details:

Full Name: _____

ID number: _____

Physical Address:
(not postal) _____

Telephone Number: _____

Cell Phone: _____

SARS Tax No _____

Tax Office: _____

Banking Details:

Payable to : _____ (name as it appears on account)

Account No : _____

Account type : _____

Bank : _____

Branch : _____

[

FORM F

(Use this form to monitor the number of tests completed per school and to insert the appropriate school code on all completed tests (i.e., on the front page of each completed instrument))

PROVINCE	SCHOOL CODE	SCHOOL NAME	NUMBER OF COMPLETED TESTS			
			Gr 3 Num	Gr 3 Lit	Gr 6 Maths	Gr 6 Sci
EASTERN CAPE SCHOOLS						
EC	B/1/6/10	Nonzwakazi				
EC	C/1/3/08	Nobumba				
EC	C/1/3/11	Nxawe				
EC	F/1/1/05	Lahlangubo				
EC	F/1/3/12	Sikhulile				
EC	F/1/4/09	Noluthando				
EC	F/1/6/16	Yonda				
EC	F/1/7/04	Kwabo				
EC	F/1/7/14	Thaba Lesoba				
EC	P/1/1/13	Southeyville				
EC	P/1/2/03	Guata				
EC	P/1/4/01	Anako				
EC	P/1/4/02	Glen Adelaide				
EC	P/1/6/06	Musa				
EC	P/1/6/15	Whittlesea				
EC	P/1/7/07	Ndofela				
KWAZULU NATAL SCHOOLS						
KZN	B/2/1/05	Manyala				
KZN	B/2/1/13	Quedeni				
KZN	C/2/3/02	Ekuthuleni				
KZN	C/2/3/14	Umgabhi				
KZN	F/2/2/01	Amatimofu				
KZN	F/2/2/07	Mathungela				
KZN	P/2/1/03	Fort Louis				
KZN	P/2/1/04	Gunukuthula				
KZN	P/2/1/06	Maqhubandaba				
KZN	P/2/1/08	Mphotholo				
KZN	P/2/1/09	Mvayisa				
KZN	P/2/1/10	Ntingwe				
KZN	P/2/1/11	Ohlahla				
KZN	P/2/1/12	Simanjalo				
KZN	P/2/1/15	Vumanhamva				
LIMPOPO SCHOOLS						
Limp	C/3/?/08	Immerpan				
Limp	P/3/1/16	Mhlava Khosa				
Limp	P/3/1/20	Ntshoenyane				
Limp	P/3/1/23	Pensele				
Limp	P/3/1/26	Plaatjie				
NORTHERN CAPE SCHOOLS						
NC	B/4/1/01	Barkley Wes				
NC	B/4/1/05	Reaipela				
NC	C/4/4/06	Rietrivier				
NC	F/4/1/03	Makurwane				
NC	F/4/2/04	Orange Diamond				
NC	P/4/1/02	DL Jansen				
NC	P/4/1/07	Wrenchville				

NOTE: A total of 27 tests per learning area are assigned for each school. Please ensure that no tests go missing in the field. Therefore, if in school B/1/6/10 only 20 tests are used, the 7 blank, unused tests are to be returned to the provincial coordinator.

APPENDIX C

DATA ANALYSIS FRAMEWORK

		BASELINE		FOLLOW UP	Test of significance		
Grade 3 Numeracy	Comparison by Group: Overall mean score max, min, std deviation	Project	↔	Project	↕	Independent sample T test	
		Control	↔	Control		Independent sample T test	
					Independent sample T test		
	Comparison of Level of difficulty (number achieving score of 50% or more)	Project			Project	N/a	
		Control			Control	N/a	
	Comparison by IEP cohort (project schools only): Overall mean score max, min, std deviation	Cohort 1	↔		Cohort 1	↕	Independent sample T test
		Cohort 2	↔		Cohort 2		Independent sample T test
		Cohort 3	↔		Cohort 3		Independent sample T test
					ANOVA		
	Comparison by Province (project schools only): Overall mean score max, min, std deviation	EC	↔		EC	↕	Independent sample T test
		KZN	↔		KZN		Independent sample T test
		LP	↔		LP		Independent sample T test
		NC	↔		NC		Independent sample T test
					ANOVA		
	Comparison by Gender (project schools only): Overall mean score max, min, std deviation	Project	↔		Project	↕	Independent sample T test
		Control	↔		Control		Independent sample T test
					Independent sample T test		
	Comparison by Skill (project schools only): Overall mean score; max, min, std deviation	Counting, ordering	↔		Counting, ordering		Independent sample T test
		Addition	↔		Addition		Independent sample T test
		Subtraction	↔		Subtraction		Independent sample T test
Multiplication		↔		Multiplication		Independent sample T test	
Division		↔		Division		Independent sample T test	

		BASELINE		FOLLOW UP	Test of significance	
Grade 3 Literacy	Comparison by Group: Overall mean score max, min, std deviation	Project	↔	Project	↑	Independent sample T test
		Control	↔	Control	↓	Independent sample T test
					Independent sample T test	
	Comparison by IEP cohort (project schools only): Overall mean score max, min, std deviation	Cohort 1	↔	Cohort 1	↑	Independent sample T test
		Cohort 2	↔	Cohort 2	↓	Independent sample T test
		Cohort 3	↔	Cohort 3	↓	Independent sample T test
					ANOVA	
	Comparison by Province (project schools only): Overall mean score max, min, std deviation	EC	↔	EC	↑	Independent sample T test
		KZN	↔	KZN	↓	Independent sample T test
		LP	↔	LP	↓	Independent sample T test
		NC	↔	NC	↓	Independent sample T test
					ANOVA	
	Comparison by Gender (project schools only): Overall mean score max, min, std deviation	Project	↔	Project	↑	Independent sample T test
		Control	↔	Control	↓	Independent sample T test
						Independent sample T test
	Comparison by Skill (project schools only): Overall mean score max, min, std deviation	Question 1	↔	Question 1		Independent sample T test
		Question 2	↔	Question 2		Independent sample T test
		Question 3	↔	Question 3		Independent sample T test
		Question 4	↔	Question 4		Independent sample T test
		Question 5	↔	Question 5		Independent sample T test
		Question 6	↔	Question 6		Independent sample T test
Question 7		↔	Question 7		Independent sample T test	

		BASELINE		FOLLOW UP	Test of significance	
Grade 6 Mathematics	Comparison by Group: Overall mean score max, min, std deviation	Project	↔	Project	↕	Independent sample T test
		Control	↔	Control		Independent sample T test
					Independent sample T test	
	Comparison of Level of difficulty (number achieving score of 50% or more)	Project		Project		N/a
		Control		Control		N/a
	Comparison by IEP cohort (project schools only): Overall mean score max, min, std deviation	Cohort 1	↔	Cohort 1	↕	Independent sample T test
		Cohort 2	↔	Cohort 2		Independent sample T test
		Cohort 3	↔	Cohort 3		Independent sample T test
					ANOVA	
	Comparison by Province (project schools only): Overall mean score max, min, std deviation	EC	↔	EC	↕	Independent sample T test
		KZN	↔	KZN		Independent sample T test
		LP	↔	LP		Independent sample T test
		NC	↔	NC		Independent sample T test
					ANOVA	
	Comparison by Gender (project schools only): Overall mean score max, min, std deviation	Project	↔	Project		Independent sample T test
		Control	↔	Control		Independent sample T test
				Independent sample T test		
Comparison by overall LO (project schools only): Overall mean score; max, min, std deviation	LO1	↔	LO1		Independent sample T test	
	LO2	↔	LO2		Independent sample T test	
	LO3	↔	LO3		Independent sample T test	
	LO4	↔	LO4		Independent sample T test	

		BASELINE		FOLLOW UP	Test of significance	
Grade 6 Science	Comparison by Group: Overall mean score max, min, std deviation	Project	↔	Project	↑ ↓	Independent sample T test
		Control	↔	Control	↑ ↓	Independent sample T test
				Independent sample T test		
	Comparison by IEP cohort (project schools only): Overall mean score max, min, std deviation	Cohort 1	↔	Cohort 1	↑ ↓	Independent sample T test
		Cohort 2	↔	Cohort 2	↑ ↓	Independent sample T test
		Cohort 3	↔	Cohort 3	↑ ↓	Independent sample T test
				ANOVA		
	Comparison by Province (project schools only): Overall mean score max, min, std deviation	EC	↔	EC	↑ ↓	Independent sample T test
		KZN	↔	KZN	↑ ↓	Independent sample T test
		LP	↔	LP	↑ ↓	Independent sample T test
		NC	↔	NC	↑ ↓	Independent sample T test
				ANOVA		
	Comparison by Gender (project schools only): Overall mean score max, min, std deviation	Project	↔	Project	↑ ↓	Independent sample T test
		Control	↔	Control	↑ ↓	Independent sample T test
					Independent sample T test	
Comparison by Skill (project schools only): Overall mean score max, min, std deviation	LO1	↔	LO1		Independent sample T test	
	LO2	↔	LO2		Independent sample T test	
	LO3	↔	LO3		Independent sample T test	

APPENDIX D

ITEM ANALYSIS OF LITERACY TEST

Table33: Comparison of mean scores across individual Literacy items

Question number	Question description	Item number	Type of item	Main Learning Outcome tested	Assessment Standard tested	Literacy Skill being assessed	Overall Mean %
1	Comprehension exercise based on narrative text, fiction	1	MCQ	Reading & Viewing	The learner understands the literal meaning of the words in the text	Literal comprehension	Baseline: 69% Follow up: 57% Difference: -12%
		2	MCQ	Reading & Viewing	The learner understands the literal meaning of elements in the story	Literal comprehension	Baseline: 67% Follow up: 50% Difference -18%
		3	MCQ	Reading & Viewing	The learner understands the literal meaning of elements in the story	Literal comprehension	Baseline: 33% Follow up: 22% Difference: -11%
		4	MCQ	Reading & Viewing	The learner understands the literal meaning of elements in the story	Inferential comprehension	Baseline: 26% Follow up: 20% Difference: - 6%
		5	MCQ	Reading & Viewing	The learner understands the literal meaning of elements in the story	Interpretive comprehension	Baseline: 21% Follow up: 22% Difference: + 0.4%
2	Picture: Linking words to appropriate picture	1	SA	Reading and Viewing Thinking & Reasoning	The learner understands the literal meaning of words and recognises them in relation to the illustration	Literal comprehension	Baseline: 52% Follow up: 37% Difference: - 15%
		2	SA	Reading and Viewing Thinking & Reasoning	The learner understands the literal meaning of words and recognises them in relation to the illustration	Literal comprehension	Baseline: 78% Follow up: 82% Difference: +4%
		3	SA	Reading and Viewing Thinking & Reasoning	The learner understands the literal meaning of words and recognises them in relation to the illustration	Literal comprehension	Baseline: 64% Follow up: 69% Difference: + 5%
		4	SA	Reading and Viewing Thinking & Reasoning	The learner understands the literal meaning of words and recognises them in relation to the illustration	Literal comprehension	Baseline: 81% Follow up: 79% Difference: - 2%

		5	SA	Reading and Viewing Thinking & Reasoning	The learner understands the literal meaning of words and recognises them in relation to the illustration	Literal comprehension	Baseline: 72% Follow up: 73% Difference: +0.6%
3	Cartoon structured narrative: Comprehension	1	MCQ	Reading & Viewing	The learner understands the literal meaning of elements in the story	Literal comprehension	Baseline: 58% Follow up: 50% Difference: - 8%
		2	MCQ	Reading & Viewing	The learner is able to make inferences about elements in the story	Inferential comprehension	Baseline: 29% Follow up: 27% Difference: - 2%
		3	MCQ	Reading & Viewing	The learner is able to make inferences about elements in the story	Inferential comprehension	Baseline: 21% Follow up: 20% Difference: + 1%
		4	MCQ	Reading & Viewing	The learner understands the sequence of events in the story	Inferential comprehension	Baseline: 23% Follow up: 25% Difference: + 2%
		5	MCQ	Reading & Viewing	The learner is able to make inferences about elements in the story	Inferential comprehension	Baseline: 15% Follow up: 17% Difference: + 2%
4	Picture: Write five sentences which describe what they see	1	ER	Reading & Viewing Writing	The learner interprets visual text and writes to describe the visual text using appropriate vocabulary and language structures	Interpretive comprehension	Baseline: 49% Follow up: 53% Difference: + 4%
		2	ER	Reading & Viewing Writing	The learner interprets visual text and writes to describe the visual text using appropriate vocabulary and language structures	Interpretive comprehension	Baseline: 47% Follow up: 52% Difference: + 5%
		3	ER	Reading & Viewing Writing	The learner interprets visual text and writes to describe the visual text using appropriate vocabulary and language structures	Interpretive comprehension	Baseline: 44% Follow up: 49% Difference: + 5%
		4	ER	Reading & Viewing Writing	The learner interprets visual text and writes to describe the visual text using appropriate vocabulary and language structures	Interpretive comprehension	Baseline: 42% Follow up: 47% Difference: + 5%

		5	ER	Reading & Viewing Writing	The learner interprets visual text and writes to describe the visual text using appropriate vocabulary and language structures	Interpretive comprehension	Baseline: 77% Follow up: 88% Difference: +11%
5.1	Cloze test with visual cues: Fill words listed into appropriate sentence context	A	SA	Reading & Viewing Writing	Learner makes value judgements by assessing appropriacy, relevance and accuracy of vocabulary	Evaluative comprehension	Baseline: 35% Follow up: 33% Difference: -2%
		B	SA	Reading & Viewing Writing	Learner makes value judgements by assessing appropriacy, relevance and accuracy of vocabulary	Evaluative comprehension	Baseline: 31% Follow up: 33% Difference: +2%
		C	SA	Reading & Viewing Writing	Learner makes value judgements by assessing appropriacy, relevance and accuracy of vocabulary	Evaluative comprehension	Baseline: 35% Follow up: 33% Difference: -2%
		D	SA	Reading & Viewing Writing	Learner makes value judgements by assessing appropriacy, relevance and accuracy of vocabulary	Evaluative comprehension	Baseline: 23% Follow up: 25% Difference: +2%
5.2	Pie Graph: Answer questions related to graph	A	SA	Reading & Viewing	Learner makes judgements by assessing the facts depicted in the pie chart according to relevance and accuracy	Evaluative comprehension	Baseline: 33% Follow up: 21% Difference: -12%
		B	SA	Reading & Viewing	Learner makes judgements by assessing the facts depicted in the pie chart according to relevance and accuracy	Evaluative comprehension	Baseline: 28% Follow up: 22% Difference: -6%
6	Table: Answer questions related to table	A	SA	Thinking & Reasoning Writing	Learner makes judgements by assessing the facts in the table according to relevance and accuracy.	Evaluative comprehension	Baseline: 22% Follow up: 9% Difference: -13%
		B	SA	Thinking & Reasoning Writing	Learner makes judgements by assessing the facts in the table according to relevance and accuracy.	Evaluative comprehension	Baseline: 21% Follow up: 14% Difference: -7%

		C	SA	Thinking & Reasoning Writing	Learner makes judgements by assessing the facts in the table according to relevance and accuracy.	Evaluative comprehension	Baseline: 29% Follow up: 20% Difference: -9%
		D	SA	Thinking & Reasoning Writing	Learner makes judgements by assessing the facts in the table according to relevance and accuracy.	Evaluative comprehension	Baseline: 36% Follow up: 23% Difference: -13%
7	Narrative: Find words in passage	A	SA	Reading & Viewing	Identifying details of content (searching and retrieving)	Literal comprehension	Baseline: 51% Follow up: 49% Difference: -2%
		B	SA	Reading & Viewing	Identifying details of content (searching and retrieving)	Literal comprehension	Baseline: 47% Follow up: 49% Difference: +2%
		C	SA	Reading & Viewing	Identifying details of content (searching and retrieving)	Literal comprehension	Baseline: 47% Follow up: 47% Difference: 0%
		D	SA	Reading & Viewing	Identifying details of content (searching and retrieving)	Literal comprehension	Baseline: 48% Follow up: 50% Difference: +2%
		E	SA	Reading & Viewing	Identifying details of content (searching and retrieving)	Literal comprehension	Baseline: 49% Follow up: 51% Difference: +3%

APPENDIX E

ITEM ANALYSIS OF SCIENCE TEST

Item	Testing Period	N	Maximum score allowed on item	Minimum score achieved on item	Maximum score achieved on item	Mean (average project school score)
Sci1_1	Follow up	809	1	0	1	.20
	Baseline	1288	1	0	1	.20
Sci1_2	Follow up	809	1	0	1	.01
	Baseline	1288	1	0	1	.03
Sci1_3i	Follow up	809	1	0	1	.22
	Baseline	1288	1	0	1	.27
Sci1_3ii	Follow up	809	1	0	1	.01
	Baseline	1288	1	0	1	.05
Sci1_4	Follow up	809	1	0	1	.06
	Baseline	1288	1	0	1	.10
Sci1_5	Follow up	809	1	0	1	.30
	Baseline	1288	1	0	1	.24
Sci2_1	Follow up	809	2	0	2	.01
	Baseline	1288	2	0	2	.01
Sci2_2	Follow up	809	3	0	3	1.35
	Baseline	1288	3	0	3	1.29
Sci2_3	Follow up	809	1	0	1	.17
	Baseline	1288	1	0	1	.11
Sci2_4	Follow up	809	1	0	1	.38
	Baseline	1288	1	0	1	.39
Sci3_1	Follow up	809	1	0	1	.32
	Baseline	1288	1	0	1	.35
Sci3_2	Follow up	809	1	0	1	.49
	Baseline	1288	1	0	1	.39
Sci3_3	Follow up	809	1	0	1	.43
	Baseline	1288	1	0	1	.38
Sci4_1	Follow up	809	1	0	1	.37
	Baseline	1288	1	0	1	.40
Sci4_2	Follow up	809	1	0	1	.43
	Baseline	1288	1	0	1	.45
Sci4_3	Follow up	809	1	0	1	.50
	Baseline	1288	1	0	1	.53
Sci4_4	Follow up	809	1	0	1	.48
	Baseline	1288	1	0	1	.48
Sci5_1	Follow up	809	1	0	1	.00
	Baseline	1288	1	0	1	.01
Sci5_2	Follow up	809	1	0	1	.01
	Baseline	1288	1	0	1	.02
Sci5_3	Follow up	809	1	0	1	.06
	Baseline	1288	1	0	2	.02
Sci6_1	Follow up	809	1	0	1	.28

	Baseline	1288	1	0	1	.27
Sci6_2	Follow up	809	1	0	1	.39
	Baseline	1288	1	0	1	.38
Sci6_3	Follow up	809	1	0	1	.30
	Baseline	1288	1	0	1	.30
Sci7_1i	Follow up	809	1	0	1	.23
	Baseline	1288	1	0	1	.16
Sci7_1ii	Follow up	809	1	0	1	.25
	Baseline	1288	1	0	1	.12
Sci7_2i	Follow up	809	1	0	1	.17
	Baseline	1288	1	0	1	.09
Sci7_2ii	Follow up	809	1	0	1	.16
	Baseline	1288	1	0	1	.10
Sci7_3	Follow up	809	1	0	1	.49
	Baseline	1288	1	0	1	.47
Sci7_4	Follow up	809	1	0	1	.02
	Baseline	1288	1	0	1	.02

