NATIONAL SENIOR CERTIFICATE

Diagnostic Report

2016

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NATIONAL SENIOR CERTIFICATE EXAMINATION 2016 DIAGNOSTIC REPORT

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FOREWORD

I am pleased to release the 2016 National Senior Certificate Diagnostic Report on Learner Performance, which is in its sixth year of publication. This report is a comprehensive analysis of candidates' performance in the third National Senior Certificate examination based on the Curriculum and Assessment Policy Statements (CAPS).

This Diagnostic report provides classroom practitioners, subject advisors, curriculum planners with insight into learners' performance in the 11 key subjects. The data and accompanying analyses prepared post the writing of the 2016 NSC examination have been used to identify strengths and weaknesses in candidates' knowledge and skills and is intended as a catalyst to improve the quality of teaching and learning through reflection and remediation at all levels of the system.

In this publication, a detailed per-question analysis of learners' responses is given for each of the 11 key subjects: Accounting, Agricultural Sciences, Business Studies, Economics, English First Additional Language, Geography, History, Life Sciences, Mathematics, Mathematical Literacy and Physical Sciences. Analysis conducted shows the weaknesses in learners' responses in the different subjects. An analysis of the misconceptions or error patterns uncovered in the learners' responses can inform instructional practice. In response to weaknesses identified, the report further suggests remedial measures that should be adopted at school level, allowing teachers to refine teaching strategies accordingly.

In addition to the aforementioned analysis, a detailed Subject Improvement Framework, which includes a Subject Improvement Plan for all subjects from grades 10 to 12, is provided. The purpose of this framework is to provide a broad outline that can be adapted by a school in the construction of their more detailed improvement plans for each subject to ensure a cohesive and focused effort towards sustainable learner improvement in the new academic year.

Teachers are encouraged to conduct and integrate the diagnostic analysis into their everyday teaching and learning, so that the performance of learners in classroom-based tests and designated school based assessment tasks are also analysed and the diagnostic analyses thereof are linked to the findings shared in this report.

The Department of Basic Education, will through targeted interventions, continue to capacitate teachers to develop responsive and appropriate instructional programmes that will successfully address the areas of weakness identified in the 11 subjects. I am confident that through this Diagnostic Report and the myriad of other interventions implemented in the system, we will see a positive impact on learner performance in 2017.

MRS AM MOTSHEKGA, MP
MINISTER OF BASIC EDUCATION
04 JANUARY 2017

CHAPTER 1: INTRODUCTION

1.1. INTRODUCTION, SCOPE AND PURPOSE

The 2016 NSC Diagnostic Report is an integral part of the ongoing initiatives by the Department of Basic Education to improve the use of the National Senior Certificate results as a diagnostic tool for improving teaching and learning. This is achieved by reflecting on the effectiveness of the instructional strategies employed in each of the 11 high enrolment subjects.

This report presents an evaluation of learner performance in the selected subjects by highlighting the areas of weakness in each of the subjects and articulating the remedial measures to be adopted at the school level to improve performance in these subjects. The findings and recommendations are based on qualitative data that is drawn from the subject reports compiled by the chief markers, internal moderators and subject specialists post the marking process. Quantitative data gathered from the analysis of 900 randomly selected scripts per subject, per province was also used to analyse learner performance on a per question basis.

As a result, this National Diagnostic Report on learner performance provides teachers, subject advisors, curriculum planners and curriculum implementers with an overview of learner performance in each of the key subjects. The Diagnostic Report in each subject, commences by presenting comparative data on the performance trends observed over a four year period in the subject, and then provides an overview of learner perfomance in the Subject and this is followed by a detailed diagnostic analysis per question in the respective question papers in each subject. Common errors, misinterpretations and misconceptions identified during marking and suggestions for improvement are provided. The poor quality of answers provided by some candidates in certain subjects continues to suggest gaps in the scope of content coverage, teaching methodology and content knowledge of some of our teachers.

In certain subjects' reports, attempts have been made to track progress made in the subject and in content areas which were highlighted as problematic in the previous years. Progress or lack thereof, in the said areas, should determine the extent to which further interventions are necessary in 2017. This also suggests that continued reference to previous Diagnostic Reports is essential since the areas of weakness identified in previous years may still be applicable in certain cases. It is these recurrent areas of weakness that must become the baseline for intervention by the Subject Advisory Services in the new academic year.

It is envisaged that subject-based diagnostic analysis will be institutionalised within the pedagogical practice not only at national level, but also at provincial, district and school levels. It is hoped that the diagnostic report will be seen as a key resource that will be utilised effectively by every Grade 12 teacher and subject advisor in 2017. Subject advisors are encouraged to mediate this key resource in their workshops with teachers in 2017.

The DBE and PEDs will monitor the distribution and utilisation of this report. Feedback from teachers and subject advisors on the usefulness of these reports and how they could be improved in future years will also be solicited.

1.2. METHODOLOGY

During the marking of the 2016 NSC examination, 100 scripts per paper, per subject, were randomly selected from each province, covering a number of districts in the province, and included samples of low, medium and high achievement scores. The internal moderators and chief markers analysed and noted learners' responses to each question. This entailed recording the marks obtained by learners from the 100 scripts on a per question basis. The individual scripts were scrutinised to provide an in-depth understanding of the different responses and to note common errors and misconceptions in the learners' responses.

Based on the analyses, a detailed explanation is provided per question/sub-question under the following main headings:

SECTION 1: PERFORMANCE TRENDS (2013 – 2016)

A comparative analysis of the performance of learners over the last four years in terms of the number of learners who wrote, the number and percentage of learners who achieved at 30% and above, and, the number and percentage of learners who achieved at 40% and above, is presented in this section. The information is represented by tables and graphs to enable easier interpretation of any trends.

Performance distribution curves are also provided to graphically present the distribution of learner scores in the last three examinations. Any improvement or decline in the performance can be observed from the position of the 2016 graph, relative to previous years. If the 2016 graph lies to the right of the two previous graphs, this suggests an improvement in performance, while a slant to the left indicates a decline in performance.

SECTION 2: OVERVIEW OF LEARNER PERFORMANCE

This section summarises the performance of learners in the question paper as a whole. It makes reference to generic areas of good performance or weakness, the possible reasons for these observations and provides general Suggestions for Improvement.

SECTION 3: DIAGNOSTIC QUESTION ANALYSIS

This includes the following:

- A graphical representation of the average percentage marks obtained per question.
- A graphical representation of the average percentage marks per sub question. (Please note that any slight variations between the graphical representations is due to data cleaning.)
- An analysis of the performance of learners in each specific question, stating whether the question was well answered or poorly answered and the reason.
- Common errors and misconceptions that were identified in candidates' responses.
- Suggestions for improvement in relation to teaching and learning, content and methodology, subject advisory support and provision, and utilisation of LTSM.

The reports from all nine provinces for each question paper, per subject were consolidated and the findings are summarised in this report. It is recommended that this report be read in conjunction with the November 2016 NSC question papers since particular references are made to specific questions in the respective question paper in each subject.

SECTION 4: SUBJECT IMPROVEMENT FRAMEWORK

The Subject Improvement Framework is developed based on the diagnostic analysis of learner responses in the 2016 NSC examinations. In addition, the Subject Improvement Framework for 2017 identifies the underlying reasons for the most common misconceptions and content knowledge gaps that need special attention in order to improve performance in the 2017 NSC examination results. It provides a broad but cohesive outline of interlinked activities for the Further Education and Training (FET) Band (Grade 10 – 12), to be undertaken by each level of the sector in order to bring about sustainable improvement in each subject. Furthermore, the Subject Improvement Framework sets out the responsibilities of the Department of Basic Education (DBE), Provincial Education Departments (PEDs), Districts/Circuits and Teachers in respect of each identified activity. The 2017 Subject Improvement Framework is developed for 27 subjects in the FET Band. Therefore this will play a key role in the development of Subject Improvement Plans (SIP) at provincial, district and school level. These SIPs will, inform teacher development and support programmes.

1.3. LIMITATIONS

The diagnostic analysis of learner performance in this publication is only limited to the eleven (11) subjects with high Grade 12 enrolments. The remaining subjects will be covered in reports compiled by the provincial chief markers and internal moderators during the marking process. The DBE will endeavour to broaden the scope of the subject coverage in future years.

The focus of this report is more qualitative than quantitative. The quantitative aspects are limited to the performance trends in each subject and the average performance per question in the 2016 examination papers. Whilst further quantitative data would have been useful in providing feedback for the purpose of test development, but that is not the intention of this report.

This report therefore provides a national summary of the areas of weakness and there is still the need to not only refer to the provincial report, but district specialists must be encouraged to develop a district diagnostic report and ultimately there should also be a school diagnostic report, which focuses specifically on the areas of weakness at the school level.

1.4. GENERAL FINDINGS

The 2016 diagnostic reports for the 11 subjects covered in this publication, indicates that the pass rate has improved in five of these subjects (Accounting, English First Additional Language, Life Sciences, Mathematics and Physical Sciences) at the 30% level, but has remained the same in History and has declined to varying degrees in the other five key subjects. It is most encouraging that there was an increase in the number of learners who sat for Mathematics and Physical Science and in both subjects the pass rate improved.

The Curriculum and Assessment Policy Statement (CAPS) was implemented for the first time in 2014 in Grade 12. In 2016 the improvements in the standard and quality of the NSC examinations and the concurrent rise in performances of the 2016 cohort compared to 2014 and 2015 signifies that the system is gradually stabilizing. In most subjects, there was an improvement in the quality of learners' responses in the 2016 NSC examination, which implies that teachers and district officials are becoming more familiar with the required content and cognitive demands stipulated in the CAPs and subsequently exposing learners to the demands of this high skills and high knowledge curriculum. Moreover, it is imperative that we reflect on and learn from the performance of candidates in the 2016 NSC examination to establish where there is improvements in the quality of the responses was observed and how these can be used as building blocks for Grade 12 teaching, learning and assessment in 2017.

The following areas of concern were identified in past Diagnostic Reports and they are, once again, highlighted as concerns in the 2016 NSC Examination.

- Question papers cover the full range of cognitive levels. In many cases, candidates appear to have coped with lower order questions that required the application of routine procedures that have been taught in the classroom. However, when the question required independent or creative thought, learners were unable to cope. This deficit related to analytical, evaluative or problem-solving questions. Higher level thinking is predicated on a sound and thorough understanding of basic concepts. It would therefore appear that these basic concepts might have been neglected by teachers and it could be assumed that learners were not provided with sufficient and appropriate application and extension exercises as part of the classroom and assessment practices.

- There is a strong correlation between reading skills of candidates and their ability to decode the requirements of a question. All the subject reports in this publication indicated that the poor language skills of numerous candidates were a major reason for under-achievement. This adversely affected the ability of these candidates to interpret questions and source material, and to frame appropriate responses to questions. This was observed in learners' incorrect interpretation of action verbs used in a question, and their lack of understanding and inability to apply the correct subject terminology. These findings underscore the importance of integrating language teaching across the curriculum and the importance of exposing learners to the range of cognitive verbs used to differentiate and assess the different levels of thinking tested in an examination paper.

- Despite the drop in performance in certain subjects, it was noted that across a number of schools there was an improvement in the quality of responses that were being presented by learners. This could imply an improvement in teaching and learning in these schools. However, at the other end of the spectrum, poor quality responses and misconceptions were still prevalent in a number of schools and these are focused on in this report.

- In the case of subjects requiring the use of mathematical or calculation skills, it was evident that candidates lacking these skills were severely disadvantaged as they were unable to earn marks for even the most basic application of these mathematical skills.

- It also appeared that a deficiency in understanding specific subject content areas was a problem in many schools. This problem appeared to be compounded by an apparent, shallow grasp of some of the content areas by teachers, or by teachers neglecting to cover certain aspects of the curriculum. The poor quality of responses even in lower-order questions suggested that some of the candidates were not adequately exposed to the relevant content at all. In addition, evidence also pointed to a cumulative deficit of subject content knowledge on the part of learners. This is an issue that must be addressed from the lower grades in the GET band and reinforced in Grades 10 and 11. Consequently, meaningful, effective and tailored interventions to strengthen teachers' professional development remains a major priority for the education system.

1.5. KEY RECOMMENDATIONS

- Past papers serve as a key resource for revision purposes. In the light of this, it must be noted that past question papers cannot be used as the only teaching and learning resource. The CAPS documents and Examination Guidelines must be followed to ensure that all topics are covered.

- It is of paramount importance that real gaps in teaching and learning are addressed through integrated interventions. Therefore, the consistent and urgent application of subject-content knowledge and teaching-practice interventions remain a priority.

- The contents of the previous Diagnostic Reports i.e. 2011-2015 are also pertinent to the gaining of a broader insight into learners' performances in the identification of gaps in teaching and learning. These previous reports must also be used in preparing the Class of 2017 for the 2017 NSC examinations.

- This report must be cascaded from the provincial to the district level and finally to the school, which is its desired destination. Subject advisers at the district level should convene workshops with the teachers under their jurisdiction and conduct on-site support visits. Subject advisers should also monitor the improvement plans of their teachers, looking specifically for the inclusion of recommendations emanating from the individual subject reports.

- District officials should closely monitor curriculum coverage to ensure that all the topics in a subject have been covered according to the Annual Teaching Plan (ATP). This would ensure that all topics receive due attention, allowing candidates to be better prepared for the examination. The monitoring process also needs to focus on the standard and quality of the assessment tasks used for SBA, as these tasks prepare learners for the NSC examinations, and they provide an opportunity for the teaching and learning interventions to gain traction well before the NSC examinations.

- Teachers should ensure coverage of the curriculum and the full range of cognitive levels in their teaching and assessment strategies. Mere recall of procedures or specific content on the part of learners will not enable them to respond fully to the demands of the question paper. Teachers must prepare learners adequately by creating learning opportunities to reflect, analyse and evaluate the content, in order to develop their holistic understanding and applied competence.

- Teachers need to focus on aspects of language competence and examination techniques. Language and comprehension skills must be developed in each classroom, across subjects. Subject terminology and definitions must be clearly understood by learners. Furthermore, learners need to have a solid understanding of action verbs that are used in the phrasing of questions and their specific meaning in the context. To this end, the DBE acknowledges that performance in learning outcomes is inextricably linked to proficiency in the Language of Learning and Teaching (LoLT). The DBE introduced a manual on the teaching of English across the Curriculum as a means of strengthening LoLT from Grade 1 to Grade 12.

- Teachers are encouraged to integrate the ideas contained in the Further Education and Training (FET) manual into their teaching by referring to the provided list of language aspects that are used mainly in the subject. To build learners' language proficiency and their confidence in decoding both the LoLT and the language of assessment, teachers are also encouraged to add their own language aspects, as these apply within the context of their schools or classrooms. Lastly, teachers across all subjects are encouraged to work collaboratively to integrate a school-based language strategy that aims to improve learner performance.

CHAPTER 2: ACCOUNTING

The following should be read in conjunction with the Accounting question paper of November 2016 examination.

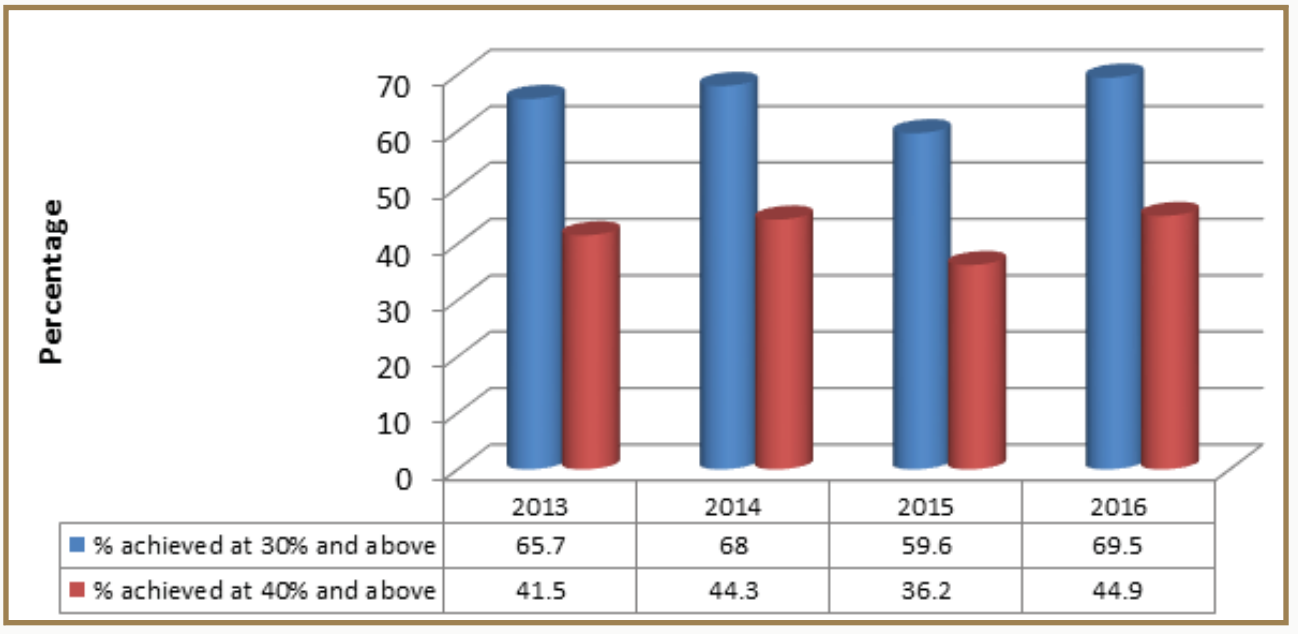
2.1. PERFORMANCE TRENDS (2013 – 2016)

In 2016, the number of candidates who wrote the Accounting examination decreased by 11 617. The general performance of candidates improved considerably this year. 69.5% of candidates achieved above 30% and 44.9% achieved at 40% and above (see table 2.1.1).

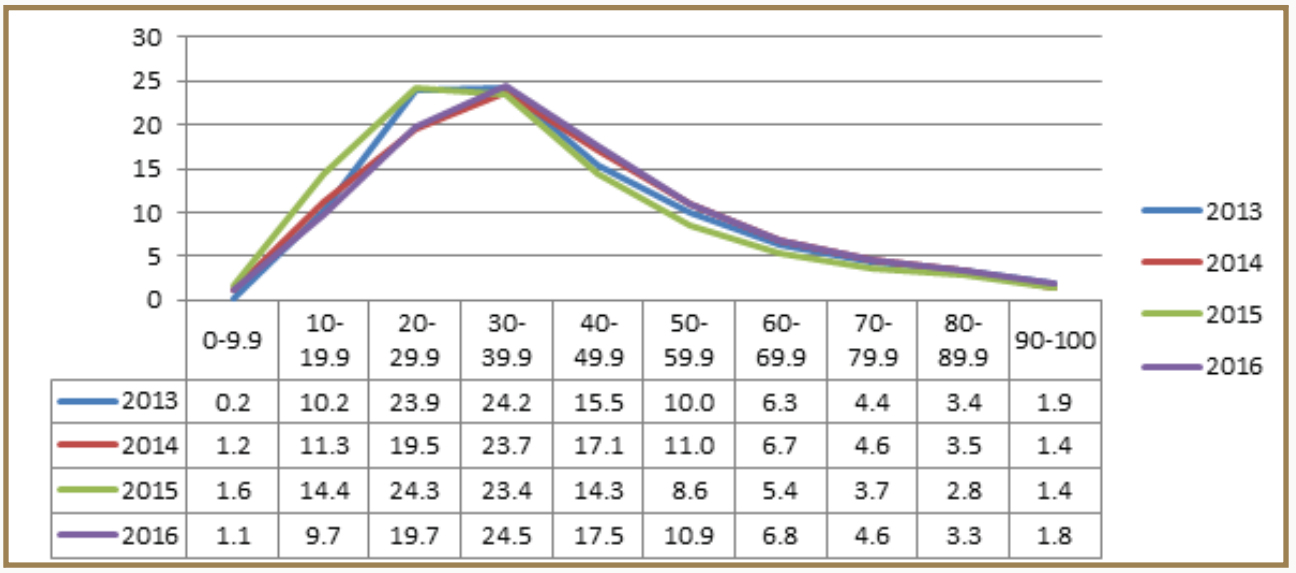
Table 2.1.1 Overall achievement rates in Accounting

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	145 427	95 520	65.7	60 311	41.5
2014	125 987	85 681	68.0	55 837	44.3
2015	140 474	83 746	59.6	50 906	36.2
2016	128 853	89 507	69.5	57 914	44.9

Graph 2.1.1 Overall achievement rates in Accounting



Graph 2.1.2 Performance distribution curves in Accounting



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.2	10.2	23.9	24.2	15.5	10.0	6.3	4.4	3.4	1.9
2014	1.2	11.3	19.5	23.7	17.1	11.0	6.7	4.6	3.5	1.4
2015	1.6	14.4	24.3	23.4	14.3	8.6	5.4	3.7	2.8	1.4
2016	1.1	9.7	19.7	24.5	17.5	10.9	6.8	4.6	3.3	1.8

2.2. OVERVIEW OF LEARNER PERFORMANCE

GENERAL COMMENTS

(a) The 2016 cohort attained better results. There was a marked improvement in the quality of candidates' responses. This year there seemed to be a significant drop in the number of weaker candidates.

(b) Since 2008, both the year-end and supplementary examination papers covered all topics outlined in the CAPS. Previous years' Diagnostic Reports also highlighted weaknesses and proposed strategies that educators and learners could have used in their preparation for the 2016 NSC Accounting examination. Therefore, candidates had extensive resource material to assist them in preparing for the November 2016 paper.

(c) CAPS content introduced in 2014 that formed part of the 2016 Accounting NSC paper, included:

- Q4.2.1 Repurchase of shares in the context of Balance Sheet notes (6 marks);
- Q5.1.3 Specific identification inventory valuation method (9 marks).

The repurchase of shares was assessed in both the 2015 and 2016 NSC papers and was well answered by most candidates. However, the Specific Identification method of stock valuation was assessed for the first time in the November 2016 Accounting paper. Many candidates found this topic quite challenging.

(d) The quality of learners' responses serves as evidence that some teachers considered the contents of past Diagnostic Reports for Accounting.

(e) Candidates who attained good grades mastered the ability to address the specific requirements of each sub-question, focused on relevant information and used the allocated time effectively. There were, however, very few centres where candidates did not attempt sub-questions.

(f) The poor quality of responses in some centres indicates that challenges in teaching and learning still prevail. It remains a concern that candidates from these centres offer inappropriate responses to questions that involve basic arithmetical calculations and/or the preparation of certain statements.

(g) Less challenging questions demanded that candidates have a basic understanding of concepts which they needed in order to engage with the more complex aspects that followed. Therefore, the inability of weaker candidates to master more complex questions could be an indication that basic concepts were not properly addressed.

(h) Factors that contributed to poor performance by weaker candidates include:

- **Inability to master certain calculations**: Accounting examination papers contain a number of arithmetical calculations, e.g. positive/negative signs, Rands/cents, percentages and ratios. Understanding the logic of these calculations is essential.

- **Inability to address the requirements of questions adequately**: In several sub-questions, learners' responses were not in line with the questions' requirements. Weaker candidates often provided incomplete or unclear responses, e.g. if an explanation is required, a one-word answer is insufficient.

- **Inability to identify relevant information**: Weaker candidates were unable to strategically identify relevant information. They tended to provide less important or immaterial information in supporting their explanations, while ignoring significantly more relevant and pertinent information.

GENERAL SUGGESTIONS FOR IMPROVEMENT

Teachers are advised to build the following practices into their work plans for the year:

(a) Use past NSC papers: Firstly, it must be noted that past question papers serve as one of many teaching and learning resources. It must be used for revision purposes only. Past papers cannot replace the CAPS document and Examination Guideline. Every learner must have access to past examination papers. Teachers can adapt certain questions, especially questions that include par value of shares and share premium, to be used for revision purposes. In addition, teachers should ensure that learners revise questions on repurchase (buy-back) of shares, Cash Budgets and Projected Income Statements in the context of companies (i.e. not simply in the context of sole traders).

(b) Basic concepts and the Accounting equation: Learners need to understand and explain basic concepts and terminology before engaging in Accounting applications in each topic.

i The most vital concepts are those contained in the expanded Accounting equation: **A**ssets + **E**xpenses + **D**rawings = **C**apital + **I**ncome + **L**iabilities. The process of conceptualizing and understanding these concepts is more than merely rote-learning definitions.

ii It is necessary that learners understand:

- current and non-current assets,
- current and non-current liabilities, and
- operating, financing and investing activities.

This will enable them to prepare and interpret the different financial statements more effectively.

(c) **Revision of relevant Grades 10 and 11 content**: 20% of an examination paper may contain content from previous grades that is pertinent to Grade 12. Vital aspects from the previous grades that must be constantly reinforced in Grade 12 teaching include disposal of fixed assets, Cash Budgets, Projected Income Statements, cost accounting and reconciliation statements (i.e. bank, debtors and creditors). The tight time frames in Grade 12 donot allow for complete re-teaching of these topics. It is advised that weaker learners practise consolidation tasks at the end of Grade 11.

(d) **Understanding basic formats**: Basic formats of financial statements and ledger accounts must be fully understood by learners.

(e) **Internal control and ethical issues**: In addition to the logic and application of each Accounting process in the curriculum, teachers should focus on the internal control measures and ethical considerations that are relevant to each process. These could be integrated at strategic and relevant points of each topic.

(f) **Enhancing learners' skills in accurately interpreting specific sub-questions and using information that is relevant**: Teachers are advised to read through and interpret the requirements of each question with learners. Learners should also be guided on how to utilize prior knowledge of a topic to identify the information that is relevant to each sub-question. Tables are often used to reduce written text.

(g) **Time management**: Learners must be trained in the art of managing their time and to adhere to the suggested time allocations provided in the paper. The mark allocation and the spaces provided in the answer book are good indicators of the amount of information needed.

(h) **Comments, evidence and explanations:** Learners must be taught to express themselves clearly and succinctly where comments or explanations are required. The use of bullet points and clear, concise sentences is acceptable. However, learners must not assume that a partial, simple or single-word response will be sufficient if an explanation is required. Language proficiency and learners' ability to express themselves clearly and precisely should not be seen as an obstacle to presenting correct responses. They should be made aware that they will often be required to quote figures or other evidence from the information provided, and that this cannot be omitted if full marks are to be awarded for an answer to a specific sub-question.

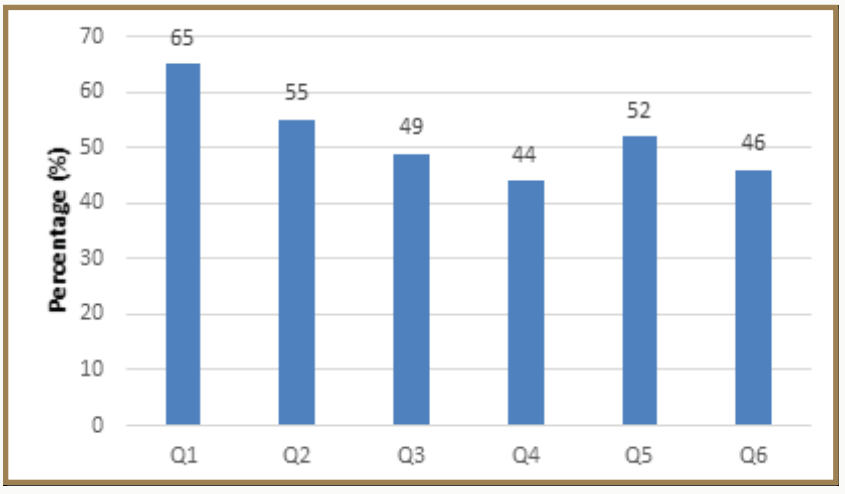
(i) **The importance of formative testing:** Short, informal formative tests must be used to build the confidence of learners. If learners do their own corrections, they gain immediate feedback and an understanding of the mark allocation. The less-challenging sections in each of the questions in the NSC Accounting papers can be used as 'confidence-boosters'. Formative tests can be used to great effect to introduce new sub-topics in CAPS, e.g. inventory valuations, repurchase (buy-back) of shares and reconciliation with creditors' statements.

(j) **Previous recommendations**: Recommendations contained in the 2015 Diagnostic Report must also be considered when preparing learners for future NSC papers. Some of these recommendations, pertinent to questions in the 2016 NSC paper, are emphasized below

DIAGNOSTIC QUESTION ANALYSIS

The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

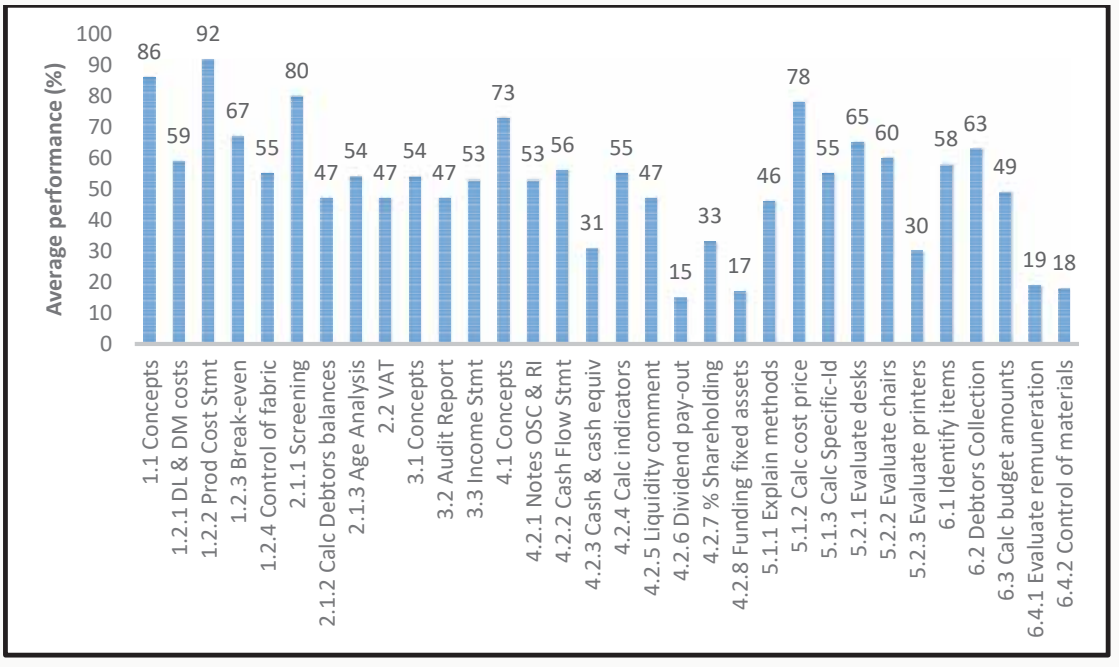
Graph 2.3.1 Average marks per question expressed as a percentage



Q1	Manufacturing
Q2	Reconciliation, Age Analysis and VAT
Q3	Audit report and Income Statement
Q4	Cash Flow Statement and Interpretation
Q5	Inventories
Q6	Budgeting

From the above graph it can be seen that performance in individual questions ranged from 44% (in Q4) to 65% (in Q1).

Graph 2.3.2 Average performance per sub-question expressed as a percentage



ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS

QUESTION 1: MANUFACTURING

Candidates generally perform well on this topic as the Manufacturing section of work comprises content that is usually found to be predictable, understandable and manageable.

Some easily obtainable marks are available if candidates understand the concepts (Q1.1; 4 marks) and the format of a Production Cost Statement (Q1.2.2; 8 marks).

The calculation of the break-even point (BEP), which was traditionally regarded as challenging (Q1.2.3; 5 marks), was correctly calculated by most candidates. In addition, they were able to comment appropriately on the BEP and the level of production. It would appear that teachers focused more attention on these aspects and targeted this question in which to score marks on relatively easy aspects.

Common errors and misconceptions

(a) Candidates could not calculate Direct Labour Cost (Q1.2.1; 8 marks). This involves a basic arithmetical calculation, based on the number of hours worked, the number of employees, the hourly rates and the percentage of an employer's contribution.

(b) The calculation of Direct Material Cost (Q1.2.1; 6 marks) integrated the use of the weighted average method to value stock used in the factory. This was intended as a relatively challenging calculation. Many candidates earned full marks on this sub-question and weaker candidates were able to earn some part-marks.

(c) Weaker candidates could not distinguish between theft of stock in the storeroom and wastage of stock in the factory (Q1.2.4; 11 marks). This implies that they did not understand the production process, or the nuances of the different processes. The average candidates resorted to using the periodic stock formula to calculate the raw material stolen (5 marks). However, they were unable to calculate the wastage in the factory (4 marks) i.e. by comparing the actual number of metres of fabric used in the factory against the number of metres expected to be used.

Suggestions for improvement

(a) Although this question did contain higher-order cognitive aspects as in previous papers, it is acknowledged that it posed fewer challenges than the other questions in this paper. Teachers are advised to revise Cost Accounting questions to ensure that learners understand a variety of questioning techniques on this topic.

(b) Learners need to understand the different components of a manufacturing entity i.e. storerooms, factory, administration and sales departments. The use of diagrams, video presentations or classroom demonstrations can be gainfully used to develop their understanding of the above processes. This should contribute to a better understanding of basic calculations relating to manufacturing concerns.

(c) Although the break-even point was generally well done, learners must be advised to consider the three essential aspects when commenting on the break-even point, depending on the requirements of a question. They should be taught to:

- compare units produced to the break-even point to assess if a profit is made,
- compare the break-even point of the current year to that of the previous year, and

- compare the units produced in the current year to that of the previous year.

This will enable learners to assess whether the business has the ability to earn a profit, and whether or not this ability is improving.

(d) Short formative tests on various calculations are advised e.g. material costs, labour costs and the splitting of costs across the different cost components (using fractions, ratios or percentages) are essential, particularly for weaker candidates. In addition, revise Grade 10 and 11 content on year-end adjustments and reversals.

(e) When teaching the Production Cost Statement, teachers are advised to refer to the unit cost of production and to unit costs for materials, labour and factory overheads. This can be done without requiring learners to calculate the unit costs at that stage, but it will serve to enhance understanding of the purpose and structure of this statement.

(f) Although this question did not involve analysis of unit costs, the Manufacturing content lends itself to deep problem-solving questions whereby a variety of information is provided and candidates will be expected to engage with the figures to identify problems and offer valid explanations and solutions. Identifying the relevant and useful information from the irrelevant information, forms part of the problem-solving skills that must be developed in learners. A variety of revision material could be used.

QUESTION 2: DEBTORS' RECONCILIATION, AGE ANALYSIS AND VAT

This was one of the better-answered questions in the paper. Aspects of this question were regarded as being of moderate challenge. The vast majority of candidates were able to provide relevant information and reasons for the screening of debtors (Q2.1.1; 4 marks). They were able to earn part-marks on the calculation of balances of individual debtors (Q2.1.2; 12 marks) and offer suggestions to improve collections from debtors (Q2.1.3; 4 marks).

Common errors and misconceptions

(a) The responses to calculation of the Debtors Control balance (Q2.1.2; 6 marks) were quite disappointing. This topic relates to basic bookkeeping covered from Grade 10. This question could be answered using either a logical calculation or a ledger account. However, weaker candidates were not able to separate the entries relating to the Debtors Control account from those relating to individual debtors. Entries requiring the correction of errors were erratically treated by candidates. All such questions require careful reading and comprehension to determine the necessary entries. It appeared that certain centres had not revised this type of question in Grade 12.

(b) The calculation of the correct balance owing by individual debtors (Q2.1.2; 12 marks) was limited to only three debtors. Some candidates appeared to do the complete reconciliation, including the other two debtors as listed in the question paper. This was not required by the question, and was explicitly reflected as such in the question paper and the answer book.

(c) Weaker candidates could not calculate the percentage of debtors complying with the credit terms (Q2.1.3; 4 marks). This question required an arithmetical calculation of a percentage, with the relevant information given in a concise table. Furthermore, weaker candidates were not able to interpret the five figures given in the table.

(d) The calculation of the amount due for VAT (Q2.2; 10 marks) was poorly done by weaker candidates. This question was expected to be done by either a logical calculation or a VAT-control ledger account. The VAT amounts for three of the five items in the question were given, but many candidates were not able to identify whether these amounts led to an increase (VAT output) or decrease (VAT input) to the VAT due to SARS. The poor calculations on the other two items indicated that weaker candidates were not able to do the basic arithmetic calculations for VAT by using either 14% or 14/114.

Suggestions for improvement

(a) Debtors, Creditors and Bank reconciliations are vital in ensuring good internal control in businesses. These reconciliations are done monthly and involve several standard procedures. It is necessary that teachers revise this topic with weaker learners on a regular basis.

(b) When teaching reconciliations, teachers should consistently refer to the internal control benefits. Learners must understand that documents received from or issued to another organization play an important part in internal control and internal audit procedures. A reconciliation becomes necessary if information on those documents does not agree with the books of a business. The differences must be identified and addressed. This point was noted in the 2014 and 2015 Diagnostic Reports in the context of creditors' and bank reconciliations respectively. It is evident that a similar lack of understanding manifested itself in certain centres in 2016 in the context of debtors' reconciliations.

(c) The CAPS stipulates basic bookkeeping in Grade 10, preparation of reconciliations in Grade 11, with the analysis and interpretation thereof in Grade 12. Learners cannot be expected to apply higher order thinking skills relating to reconciliations if they have not acquired the necessary confidence in the lower- or middle-order application processes. The CAPS stipulates that examinations may comprise content from previous grades that has an impact on assessment in subsequent grades, to an extent of 20% of an examination. Teachers of Grade 12 learners must therefore ensure that there is adequate in-depth revision in all forms of reconciliations that are covered in Grade 10 and 11 (i.e. bank reconciliations, creditors' reconciliations, and reconciliations of debtors/creditors lists to the control account).

(d) Regarding VAT, teachers are advised not to over-complicate this content with the VAT-input and VAT-output ledger accounts in Grade 11. The understanding of the VAT-control account is sufficient, as stipulated in the CAPS. Teachers are advised to teach the logic of this account, and why it may have a debit or credit balance, depending on whether VAT is owed to or due by SARS. Learners must be made to appreciate the similarity to a Debtors Control (in the case of a debit balance) or Creditors Control account (in the case of a credit balance). The basic VAT calculations involving 14% and 14/114 will have to be diligently revised with weaker learners.

QUESTION 3: AUDIT REPORT AND INCOME STATEMENT

The specific financial adjustments in this question reflected a range of challenges, from easy to difficult. This question was one of three in the 2016 paper that reflected an average of below 50% from the sample of candidates. Capable candidates were able to achieve well, while weaker candidates continue to reveal serious errors of principle in their responses.

Common errors and misconceptions

(a) In Q3.1.4 (4 marks), candidates could not conceptualize the components of the Accounting equation.

(b) The questions on the Audit Report (Q3.2; 6 marks) were poorly done. Some candidates were not aware that the audit report is primarily addressed to shareholders and that the board of directors is accountable for preparing and publishing the financial statements. They could not satisfactorily explain the nature of an unqualified report or the reason why specific page numbers are mentioned in the audit report. Many candidates offered the completely inappropriate response of 'statistical sampling' as a reason for the reference to page numbers.

(c) In the question on the Income Statement, candidates did not have a firm grasp of the following:

- Entry of pre-adjustment figures in the appropriate places (Q3.3; 11 marks)
- Sub-totals calculated in the normal top-down manner of preparing the Income Statement (Q3.3; 4 marks)
- Adjustments to audit fees, repairs and packing material (Q3.3; 3 marks)
- Method marks on certain income and expense items (Q3.3; 6 marks)

Some candidates were not able to identify whether adjustments would cause increases or decreases to certain expense and/or income items.

(d) Many candidates experienced difficulty in calculating Income Tax correctly from the net profit after tax (Q3.3; 2 marks). They found it a challenge to identify the missing figures for interest income, operating expenses and sundry expenses, which required them to work backwards from the net profit (Q3.3; 5 marks).

(e) Weaker candidates found the following to be challenging:

- Calculation of cost of sales using the mark-up percentage after allowing for trade discounts (Q3.3; 3 marks)
- Adjustment of rent income by off-setting repairs and allowing for an accrual (Q3.3; 4 marks)
- Rectifying the incorrect depreciation on an asset stolen (Q3.3; 4 marks)
- Allowing for sales returns in calculating the stock deficit (Q3.3; 2 marks).

Suggestions for improvement

(a) The recommendations noted below serve to re-emphasize similar comments noted in previous Diagnostic Reports.

(b) Refer also to the General Comments above for points on *Basic concepts and the Accounting equation.* It is essential that the expanded Accounting Equation (A+E+D=L+C+I) be fully understood from an early stage of studies in Accounting, i.e. from the GET phase, and particularly from Grade 10 in the FET phase. Learners should be provided with a comprehensive list of items in random order. They should then be required to identify whether an item would have a debit or credit balance, the applicable category from the Accounting equation, and the category under which the item will be reflected in the financial statements.

(c) The formats of financial statements are rooted in the basics of financial reporting, covered in Grade 10, which must be revised and reinforced in Grades 11 and 12. Learners must be familiarized with the basic formats and relevant notes of all financial statements from Grade 10. This can be achieved by formative testing of formats, with and without figures.

(d) Marks can be earned on pre-adjustment figures, and method marks may also be earned on final figures for certain challenging items even if adjustments are incorrectly calculated. This can be communicated to learners through formative class tests which are either peer or self-marked, followed by a full explanation of the principle of method marks.

(e) Short, regular formative testing on calculations and/or complex adjustments, such as those mentioned above in the context of Q3, can be conducted without the need to prepare the financial statements. A collaborate learning approach can be conducted on a piecemeal basis, with a focus on one or two complex adjustments.

(f) With reference to the Audit Report, learners should first be required to engage meaningfully with each paragraph in a standard unqualified audit report, to understand the need for each paragraph, and to appreciate the differences that could exist if an independent auditor is not able to issue an unqualified opinion. In this way, learners will be exposed to the three different types of audit reports i.e. unqualified, qualified and a disclaimer of opinion.

QUESTION 4: CASH FLOW STATEMENT AND INTERPRETATION OF FINANCIAL INFORMATION

This question comprised basic concepts, notes to the financial statements, extracts from the Cash Flow Statement (CFS) and analysis and interpretation of financial indicators of companies. Candidates generally find these topics challenging. The relatively low average from the sample of candidates' scripts confirms this conclusion.

Most candidates understood the basic concepts (Q4.1; 4 marks) and were able to satisfactorily complete the notes for Issued Share Capital (Q4.2.1; 7 marks) and Retained Income (Q4.2.1; 9 marks), the calculation of the loan and income tax paid for the CFS (Q4.2.1; 6 marks), the calculation of financial indicators (Q4.2.4; 15 marks) and the comment on liquidity (Q4.2.5; 6 marks).

Relatively new content comprised entries in the notes for Ordinary Share Capital and Retained Income in respect of the repurchase of shares (Q4.2.1; 6 marks). It was evident that many centres had focused more attention on this new content, and most candidates were able to earn part or full marks for this transaction.

It appears that there is an improvement in learners' understanding of the calculation of financial indicators (Q4.2.3; 15 marks). However, in-depth revision with each cohort of learners is imperative.

Common errors and misconceptions

(a) Candidates generally performed poorly on the net change in cash and the cash equivalents section of the CFS (Q4.2.3; 4 marks). Most candidates earned only one or two marks on this sub-question. Many candidates were not able to calculate the figure at the beginning of the year by offsetting the cash asset against the bank overdraft. Candidates did not recognize that a conversion from an overdraft situation to a positive balance reflects a significant cash inflow. Moreover, weaker candidates could not correctly calculate the income tax paid (Q4.2.2; 4 marks). These sections of the CFS clearly need greater revision.

(b) Many candidates could not calculate the interim dividends for the purpose of the Retained Income note (Q4.2.1; 3 marks). The dividends paid figure from the CFS was provided. Candidates were expected to subtract the final dividends of the previous year (R162 000) from this amount (R434 250). Some used the Net Asset Value per share to calculate the Retained Income balance at the end of the year and proceeded to work backwards in the note. Others reconstructed the Dividends Paid note (as discussed in certain textbooks and study guides) to find the total dividends, from which they deducted the final dividends of the current year.

(c) Some candidates were able to correctly provide the three relevant financial indicators that supported the statement that the liquidity has improved (Q4.2.5; 6 marks). Many candidates incorrectly quoted the creditors' payment period and the stock turnover rate, which had either deteriorated or remained constant. In quoting the indicators, weaker candidates neglected to quote the trends from one year to the next.

(d) The question requiring calculations to show the change in dividend pay-out policy was poorly done by most candidates (Q4.2.6; 4 marks). Most candidates simply quoted the DPS of each year, instead of considering EPS to evaluate the pay-out %. This was intended as a higher-order question, and it proved to be accessible only to the more competent candidates. .

(e) The lack of arithmetic ability of many candidates was evident in the calculation of the CEO's % shareholding (Q4.2.7; 4 marks). Some candidates provided completely inappropriate calculations.

(f) The identification of major sources of funding for the purchase of fixed assets (Q4.2.8; 4 marks) was very poorly attempted. This was disappointing, particularly as candidates were advised to make reference to figures over R1m, and the two sources were very obvious. Many candidates were able to identify one or both sources correctly, but did not support this by quoting relevant figures as required by the question. .

Suggestions for improvement

(a) The preparation and interpretation of a CFS and the calculation and interpretation of financial indicators have traditionally presented difficulties for both teachers and learners. The recent and gradual improvement in these areas is acknowledged. Teachers are however, advised to not be complacent by assuming that each cohort of learners will reflect the same degree of confidence and ability in these areas. A strong foundation needs to be laid in Grades 10 and 11 regarding basic concepts and the calculation and interpretation of financial indicators.

(b) Teachers are advised to conduct regular class discussions on the figures calculated by learners when undertaking tasks on preparation of CFS. This will serve to develop an understanding of the logic of this statement, which will further enhance learners' ability to understand and to evaluate figures therein. For example, movement of bank balances from overdraft to positive would reflect an inflow of cash; and increases in loans and share capital would be used as sources of funding for expansion of the company.

(c) Most examination papers will include sections of a CFS or they may include calculations to assess learners' knowledge of the topic. Teachers are advised to focus on specific aspects in isolation in order to develop learners' confidence in identifying appropriate figures and in practicing the correct use of brackets to indicate outflows when a CFS, or parts of it, are required e.g. the difference between loans at the beginning and the end of a financial year will indicate the value of the cash outflow (in brackets) or the cash inflow (without brackets). Since the main purpose of the CFS is to clearly reflect the inflows and outflows of cash, learners must understand that they will be penalised if inflows and outflows are not properly indicated as such by making effective use of the brackets.

(d) Learners need to understand the logic underlying each financial indicator. For example, solvency is the ability of a company to settle all debts, which means that all liabilities and all assets must be considered. It is a retrogressive step to expect learners to memorize formulae as the main priority, because these can easily be forgotten if the underlying logic is not understood. Inserting figures into a rote-remembered formula serves no positive educational purpose, as learners will not be able to offer meaningful interpretations of the results. It is therefore important that formative class tests should cover both the calculation and the purpose of the financial indicator.

(e) Basic arithmetical calculations relating to financial indicators should be revised on a regular basis. Teachers need to identify any challenges and address them on an individual basis with their learners.

(f) Teachers must inform learners that questions covering interpretation of financial information could comprise:

- Evaluation of one company over time, in which case answers should involve comparing and quoting of trends from one year to the next; or
- Evaluation of a company's performance against set targets, e.g. gross profit %; or
- Evaluation of more than one company, in which case, answers should involve specific comparisons and quoting of indicators of each company.

(g) The second term project on published financial statements can serve as a useful tool to encourage individual work on a real-life experience.

(h) In interpreting financial statements, teachers should devote time to brief discussions on the statements prepared, i.e. whether the figures are satisfactory, whether they are significant (i.e. material) or not, and whether they reflect good or bad decisions by directors. This will serve to sow the seeds of an analytical or inquisitive approach in learners, thereby broadening their understanding of financial statements and financial indicators. Analogies of other types of indicators found in real-life situations, e.g. batting or bowling averages in cricket, could be used to good effect in enhancing understanding of how financial indicators should be used as signals of positive points or problems rather than as conclusive evidence.

(i) In teaching the repurchase of shares, teachers are advised to use the figures in a question to calculate % shareholdings of hypothetical minority or majority shareholders with their classes. This should help learners to appreciate that decisions on share repurchases or the issue of new shares can positively or negatively affect the remaining shareholders.

(j) Regarding the repurchase of shares, teachers are advised not to unnecessarily complicate the entries by introducing new ledger accounts. Teachers are referred to the Examination Guidelines for further explanation. In essence, learners need to focus on the simple overall effect which is summarised as follows:

Reduce: Share capital	By: The number of shares repurchased (based on average issue price per share).
Reduce: Retained income	By: The difference between the amount paid to repurchase the shares and the issue price of the shares repurchased (based on average issue price).
Reduce: Bank	By: The total amount paid to repurchase the shares
Note that shares repurchased at a price below average issue price are not often encountered in practice, and will therefore not be examined at Grade 12 level.	

QUESTION 5: INVENTORIES

Candidates generally performed well in this question, which comprised two main parts.

- Q5.1 focused on stock valuation, a topic which most candidates find manageable.
- Q5.2 focused on control of three items of stock. This was structured and presented in a problem-solving style, requiring identification of figures and rendering explanations and advice. In this regard, many candidates were able to earn part-marks or full-marks on the evaluation of desks (Q5.2.1; 6 marks) and evaluation of chairs (Q5.2.2; 5 marks).

Common errors and misconceptions

(a) It was evident that many candidates could not effectively explain the difference between the FIFO and Specific Identification methods (Q5.1.1; 4 marks). Many earned part-marks on this question because of incomplete or unclear answers.

(b) The performance of candidates on the calculation of the closing stock using the Specific Identification method (Q5.1.3; 9 marks) was variable and disappointing. This question was regarded as being of moderate challenge. Some candidates had effectively employed the logical and efficient method of valuing the closing stock by using the units counted at year-end and multiplying those by their specific cost prices. Many centres used the totals for opening stock, purchases, returns and cost of sales to arrive at the closing stock value. Although this will lead to the correct answer, it is usually more time consuming. It was also evident that candidates from several centres were ill-informed on how to do the calculation. The adequate teaching of this topic is needed in all centres.

(c) In Q5.2.1 and Q5.2.2, weaker candidates were not able to provide two valid points on each item of stock, or did not quote appropriate figures.

(d) In Q5.2.3, many candidates simply provided general suggestions, which were not based on the source material, thereby earning only part-marks as figures could not be provided. Candidates also overlooked the obvious point of competitors' prices in evaluating price increases and the effect on profits.

Suggestions for improvement

(a) Teachers should encourage learners to verbalise explanations of the following three main stock valuation methods in class and in formative tasks: FIFO, Weighted Average and Specific Identification. In this way, learners would be able to internalise the procedures inherent in each method.

(b) In covering the Specific Identification method, teachers are advised to approach this from both perspectives:

- **Method X**: valuing stock by using units counted at year-end and multiplying those by their specific cost prices;

- **Method Y**: using totals for opening stock, purchases, returns and cost of sales to arrive at the closing stock value. This method however, may require the calculation of the cost of sales (which is not normally given), and may therefore be time consuming.

  Learners will then acquire a complete understanding of the retail process and stock values, which will have benefits for their understanding of other Financial Accounting and stock valuation topics. However, for the purposes of summative examinations such as the NSC examination, method X above might be the more efficient method to use, depending on the information provided in the question and the mark allocation.

(c) Teachers must continue to expose learners to problem-solving questions, which require learners to identify problems, quote evidence, and offer valid creative solutions or advice.

QUESTION 6: BUDGETING

This question was one of three in the 2016 paper that reflected an average below 50% from the sample of candidates' scripts.

Candidates found the interpretation of budgetary information challenging. However, they were generally able to achieve well on identifying incorrect items in the budget (Q6.1.1; 2 marks), on identifying items that would not appear in a projected Income Statement (Q6.1.2; 2 marks), and on the completion of the Debtors' Collection Schedule (Q6.2; 9 marks).

Performance on the remaining sub-questions was generally disappointing.

Common errors and misconceptions

(a) In Q6.3, weaker candidates were unable to calculate cash sales as a % of total sales. Payments to creditors [Q6.3 (b); 4 marks] is a necessary calculation for a Creditors' Payment Schedule, all candidates were expected to know this calculation. The calculation of directors' fees [Q6.3(c); 5 marks)] and interest on loan [Q6.3 (d); 6 marks] required basic arithmetical skills coupled with some interpretation. The calculation of directors' fees required candidates to use the number of directors and the % increase, while the interest calculation required candidates to work backwards from the monthly interest using the interest rate and the number of months in the year. A number of candidates were not able to cope with such calculations.

(b) In Q6.4.1, many candidates were unable to identify the obvious change in the method of payment from salaries to commission. Some candidates did not understand the term 'commission'.

(c) The question on assessing increased spending on packing materials (Q6.4.2; 5 marks) was intended as a more challenging sub-question. Well-prepared candidates were able to easily achieve these marks. Most candidates simply mentioned the increase in expenditure on packing materials, without taking into account that expenditure on packing materials is directly affected by sales. In this case, Sales exceeded budget by 70%, while Packing Materials were only 5% over budget. This would tend to reflect good control. Both items had to be mentioned to earn full marks.

Suggestions for improvement

(a) Content in the Grade 11 CAPS relates to the preparation and presentation of the Cash Budget and the Projected Income Statement. It is essential that the Grade 11 content be effectively revised in order to develop learners' proficiency in identifying and calculating relevant figures. This would serve to improve learners' confidence in interpreting the figures, as stipulated in the Grade 12 content. Teachers are advised to encourage learners to actively engage with questions involving interpretation of a Cash Budget and Projected Income Statement in class and in their revision activities.

(b) Basic calculations must be practised to ensure that learners master the application of arithmetical logic. Learners must be aware that marks are awarded for quoting the relevant figures as evidence where explanations are required.

(c) Learners should be made aware that concepts and calculations covered under other topics in the Accounting curriculum are also relevant in the context of Budgeting. In this question, weaker learners did not understand 'commission', a term that is covered in the context of Manufacturing with regard to the Selling & Distribution department. In assessing unit costs in the context of Manufacturing, learners should be familiar with direct and variable costs as opposed to fixed costs. This should enable them to appreciate that in a manufacturing business, production levels are relevant in assessing variable costs, while in a trading business, sales volume is relevant in assessing variable costs such as packing materials.

(d) Quite often, weaker candidates cannot interpret a question or given information. Teachers are advised to read a specific question and the relevant information with their classes. Learners can then answer the question and corrections should be done in class.

CHAPTER 3: AGRICULTURAL SCIENCES

The following should be read in conjunction with the Agricultural Sciences question papers of the November 2016 NSC examination.

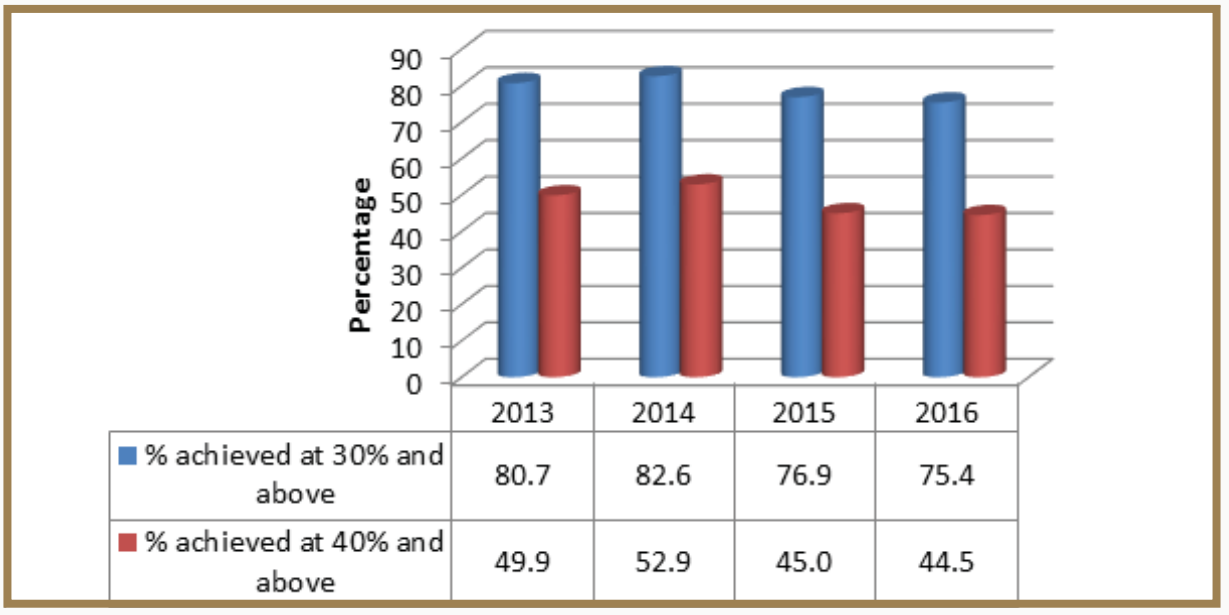
3.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates has increased by 2 203 since 2015. The general performance of candidates has declined, as indicated by 75,4% of candidates' having achieved at 30% and above, with 44, 5% achieving at 40% and above.

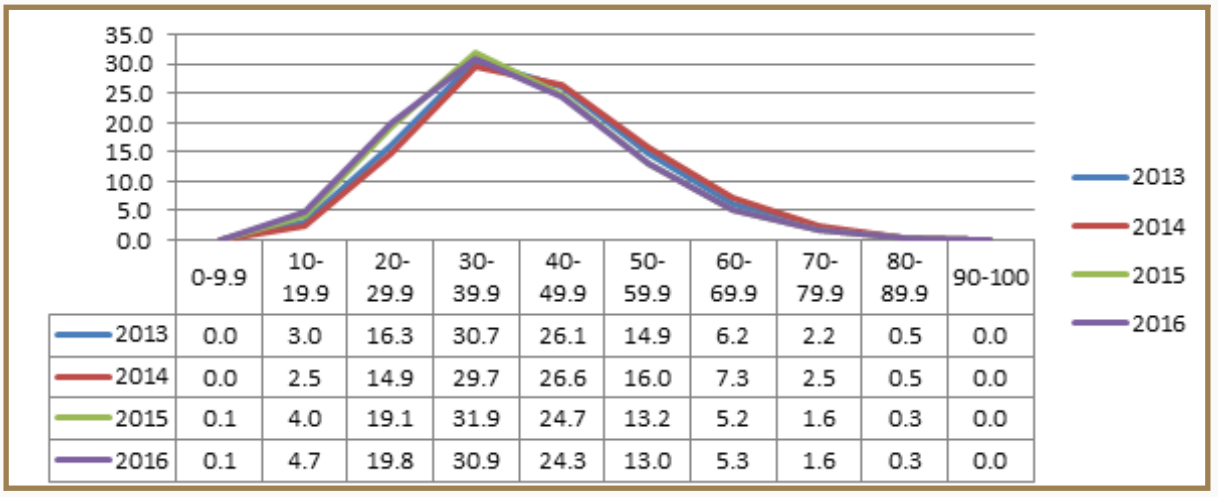
Table 3.1.1 Overall achievement in Agricultural Sciences

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	83 423	67 437	80,7	41 654	49,9
2014	78 063	64 486	82,6	41 280	52,9
2015	104 251	80 125	76,9	46 895	45,0
2016	106 386	80 184	75,4	47 332	44,5

Graph 3.1.1 Overall achievement in Agricultural Sciences



Graph 3.1.2 Performance distribution curves in Agricultural Sciences



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.0	3.0	16.3	30.7	26.1	14.9	6.2	2.2	0.5	0.0
2014	0.0	2.5	14.9	29.7	26.6	16.0	7.3	2.5	0.5	0.0
2015	0.1	4.0	19.1	31.9	24.7	13.2	5.2	1.6	0.3	0.0
2016	0.1	4.7	19.8	30.9	24.3	13.0	5.3	1.6	0.3	0.0

The above graph indicates that there has been a decline in the performance of candidates in 2016.

3.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

GENERAL COMMENTS

(a) Whilst the performance of candidates in question 1 improved by 10 percentage points as compared to 2015, their performance mainly on sub-questions that required subject terminology (Q1.3 and Q1.4) was disappointing.

(b) The performance in question 2 on animal nutrition has declined as compared to 2015. The decline could be attributed to candidates' inability to calculate the fodder flow and misinterpretation of the Pearson square.

(c) Question 4 on animal reproduction was comparatively better answered. Candidates displayed a better understanding of techniques used to increase the number of offspring, better interpretation of dystocia and multiple births.

(d) As in the previous years, data response questions posed a challenge to candidates as they were unable to interpret graphs, tables, illustrations, pictures and diagrams.

(e) Follow-up questions requiring motivation or justification were poorly answered by most candidates, indicating a lack of exposure to these types of questions in class.

(f) As indicated in previous years' Diagnostic Reports, assessment tasks should contain data response questions so that learners develop the skill of interpreting data and responding accordingly. Informal assessment tasks should be set so as to help learners develop the skill of being able to compare information, as was the case with comparing semen volume and semen concentration.

(g) In the teaching of a graph, it is important that learners be made aware that the independent variable should always be on the X-axis and the dependent variable should be on the Y-axis as indicated in the 2015 diagnostic report. In the drawing of the graph, the following criteria should be taken into consideration:

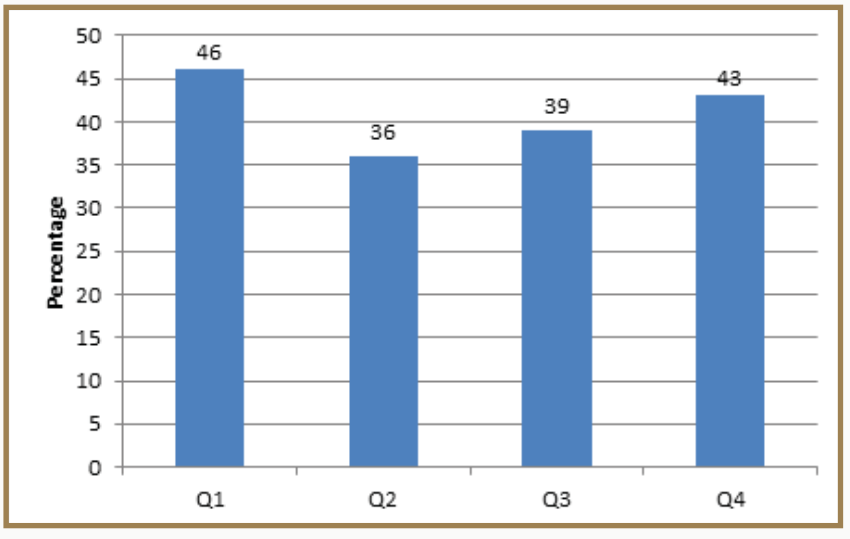
- Correct heading
- Type of graph (bar/line)
- X-axis correctly labelled
- Y-axis correctly labelled
- Correct units on both axes
- Accuracy

3.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

3.3.1 PERFORMANCE PER QUESTION

The following graph is based on data from the Rasch analysis of randomly sampled candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

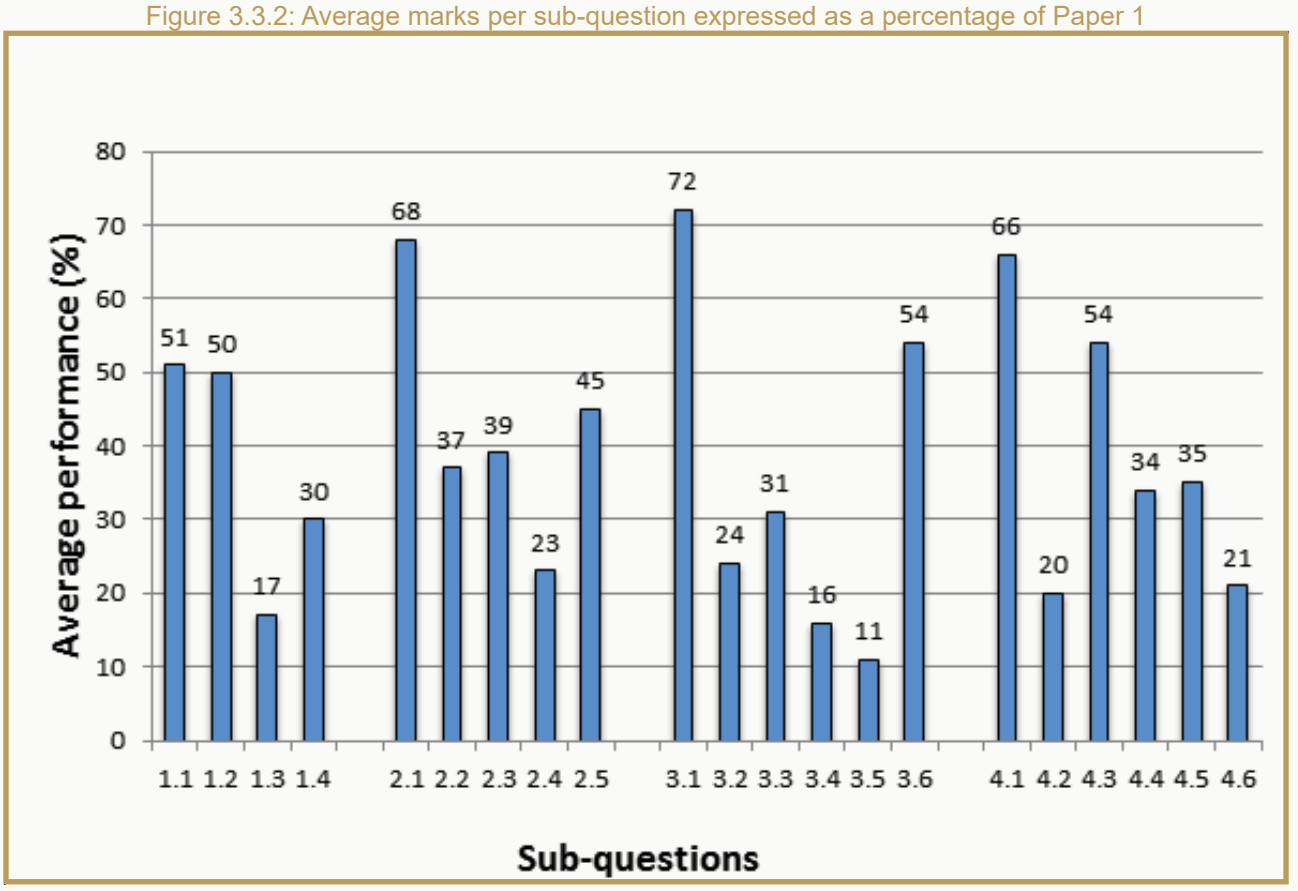
Figure 3.3.1: Average marks per question expressed as a percentage of Paper 1



Q1	Multiple choice, match type, terminology & replacement: Animal Sciences
Q2	Animal nutrition
Q3	Animal production, protection and control
Q4	Animal reproduction

The worst performance by candidates was in the question on animal nutrition (calculations of fodder flow and Pearson square) and in those sub-questions requiring subject terminology (match type, terminology and replacement).

Figure 3.3.2: Average marks per sub-question expressed as a percentage of Paper 1



3.4. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 1

QUESTION 1: SHORT QUESTION (ANIMAL SCIENCES)

This question is based mainly on subject terminology. In 2016, whilst it was the most successfully answered question, the responses of candidates reflect that there was still a lack of knowledge of subject terminology, as well as misinterpretation of questions. This is a worrying and recurrent trend in recent years.

Common errors and misconceptions

(a) Responses of candidates demonstrated that there is still a challenge in the mastery of subject terminology as candidates were unable to interpret the concept of nutritive ratio in Q1.1.4; they added the DP (digestible protein) to TDN (total digestible nutrients) instead of subtracting the DP from TDN to obtain the non-nitrogen content.

(b) Q1.1.7 required a production system applicable to pigs but most candidates selected a backyard and deep litter system instead of a backyard and free range system.

(c) Candidates lost the 2 marks for Q1.1.8 as they could not accurately distinguish between the levels of seriousness of a disease (acute ;per acute). The inability of candidates to respond to the instruction of identifying the INCORRECT statement also contributed to the poor performance in this sub-question.

(d) Candidates did not understand biuret as a protein rich supplement in Q1.2.1. A distinction should be made as molasses is a carbohydrate-rich supplement used to improve palatability and supply energy to animals.

(e) Q1.3.1 was poorly dealt with as candidates were unable to identify the concept of polyneuritis as they failed to interpret the 'neuromuscular' as the guiding word.

(f) In Q1.4.1, candidates could not correctly identify the feed conversion ratio (FCR): responses like fodder flow, feed conversion and maintenance ratio were mostly provided as answers.

(g) It should be noted that candidates did not adhere to the instruction in Q1.2 as they still wrote 'A' or 'B' instead of 'A only' or 'B only'.

Suggestions for improvement

(a) Various approaches to teaching calculations should be followed and teachers should afford learners numerous opportunities to try out calculations, thereby exposing them to different ways in which a question could be asked –as was the case in Q1.1.4.

(b) Teachers should make subject terminology part of daily assessment and should make a glossary of terms for each topic to be taught and issue it well in advance in order for learners to know which terms need to be mastered. Assessment of these could be made interesting and motivating for learners through the introduction of speed tests on crossword puzzles, matching items, one word answers and multiple choice items.

(c) Learners should also be encouraged by teachers to prepare a concept bank for each topic. The learning with understanding of such terms should be encouraged by giving them monthly mock examinations on terms and concepts, with a view to preparing them for the actual examinations

(d) As was indicated in the 2015 diagnostic report, informal assessment tasks should include the replacement question so that the instruction to write 'A only, B only, Both A and B or None' could be practised and learners who fail to follow the instruction should be penalised.

QUESTION 2: ANIMAL NUTRITION

The performance of candidates in this question has declined by 9 percent as compared to 2015. It was the question that received the poorest responses in 2016.

Common errors and misconceptions

(a) Instead of providing the type of farm animal represented by the diagram in Q 2.1.1, candidates indicated the specific farm animal ('pig' instead of 'monogastric animal'). This had an impact on the subsequent question (Q2.1.2), where candidates could not use the diagram to motivate the answer in Q2.1.1.

(b) Candidates lost marks in Q2.1 because they were unable to link the reason for the answer to Q2.1.1 (farm animal 2) with the structure of the stomach that mainly describes the non-ruminant. Instead, they referred to the parts of the alimentary canal of a fowl.

(c) In Q2.1.3, candidates correctly identified the feed constituting the greatest percentage of the ration for the ruminant (roughage), but failed to provide the reason for feeding roughage to a ruminant. Instead, they wrote about functions of roughage and its characteristics which were not relevant.

(d) The inability to adhere to instructions was once again evident in Q2.1.5 where candidates could not write the letter of the part that enables farm animal 1 to digest roughage; instead they labelled parts A to E for one mark.

(e) Q2.1.6 required an explanation of how proventriculus (label E) and a crop (label D) assist in the digestion of grain feed. Candidates confused the functions of the two labels with regard to digestion.

(f) In Q2.2.3, candidates were unable to present the formula for Digestible Energy in a scientific form: DE = GE – Energy lost in manure. Instead, they wrote GE-Energy lost in manure. As a result, they lost the mark.

(g) Candidates were expected to respond to what determines the high biological value of lucerne compared to barley in Q2.3.2. Instead, they wrote that lucerne has a higher biological value than barley, which was a repetition of the question.

(h) In Q2.4.4, candidates displayed a lack of understanding of sustainability and the concept of fodder flow in animal production. They could not give the sustainable action the farmer needs to take to address shortage. Instead, they gave responses such as buying feed or providing supplementary feeding, which are not sustainable measures.

(i) In Q2.5, candidates showed a lack of mathematical skills in calculating an amount in kg from the percentage given. Some calculated the maize meal amount (kg) using the values of the sunflower oilcake meal. As a result, their responses affected performance in the subsequent question (Q2.5.2).

Suggestions for improvement

(a) Interpretation of the alimentary canals is still a challenge. It is advised that different diagrams of alimentary canals should be taught simultaneously and a variety of textbooks and resources with similar information should be used. Practical exposure to different alimentary canals could also assist in the development of in-depth understanding.

(b) Teachers should emphasise the concept of biological value during teaching and refer mostly to the purpose of nutrients composed in each feed.

(c) Teachers are advised to promote reading and analysis of texts and should discourage learners from memorization without having an understanding of the concepts.

(d) In the teaching of a fodder flow programme, teachers should refer to the CAPS policy document that requires a basic calculation of a feed/fodder flow programme for a group of livestock (number of animals and feed needed over a period of time). This should also involve the calculation and the drawing of feed requirements using a Single Pearson Square method and ensure that learners are able to interpret the results.

(e) Learners should be taught that a feed rich in protein should have a lesser value in the ratio to give the desired DP (digestible protein); otherwise, a higher value of a protein- rich feed in the ratio will exceed the required DP (digestible protein) and will be very expensive to the farmer.

(f) Calculations form an integral part of animal nutrition. Teachers should therefore integrate calculations into the informal and formal assessment tasks. They should emphasise the use of correct formulae that will help learners to develop their ability to make accurate calculations. Teachers should further inculcate in learners an understanding that Agricultural Sciences is a science subject and that all formulae should therefore be scientifically presented.

QUESTION 3: ANIMAL PRODUCTION, PROTECTION AND CONTROL

(a) In Q3.1.1,candidates were able to draw the graph, understand aspects such as the type of graph, provide a correct heading and indicate units correctly. However, scaling is still a challenge which affects the correct plotting of the graph. Some candidates struggled to differentiate between dependent and independent variables and as a result they could not provide a correct trend for the graph drawn in the subsequent question (Q3.1.2). There were also instances of drawing a histogram instead of a bar graph.

(b) Q3.2 required in-depth understanding of animal production and handling with emphasis on tools and facilities utilised by farmers. In Q3.2.1, candidates were unable to correctly identify the tool (elastrator) in the picture, which led to a loss of 4 marks in subsequent sub-questions.

(c) Candidates could not identify a facility to direct farm animals towards a loading ramp (crush) in Q3.3.1. As a result, they were unable to know the measures to consider when constructing the crush.Candidates confused the measures to design the crush with the precautionary measures to reduce stress when transporting farm animals.

(d) In Q3.4.2, candidates identified a pupa as a harmful stage in the life cycle of a blowfly, instead of a larva/ maggot. This kind of mistake clearly indicated the extent to which life cycles of external parasites are not taught and assessed properly in the classroom.

(e) In Q3.4.5, candidates were expected to write the **non-chemical** management practices to control blowfly infestation. Candidates lost marks because they wrote about any management practice to control infestation, which indicated that learners lacked the skill to identify the main phrase in a question, in this case, **non-chemical**.

(f) In Q3.5, candidates did understand that overgrazed camps can be controlled through rotational grazing; however, they displayed an inability to apply their knowledge to other agricultural situations. For example, Q3.5.1 required them to identify the control measure a farmer might take to prevent plant poisoning in animals grazing after being transported over long distances. A number of candidates' responses did not refer to when the animals should be fed.

Suggestions for improvement

(a) Heat stress should be taught to learners and this should not be isolated from the management practices to reduce heat stress. Teachers should consult a variety of resource materials on signs of heat stress.

(b) In the teaching of animal handling, teachers should emphasise the different techniques/tools/aids utilised to handle farm animals and also the basic guidelines/requirements for transporting/moving farm animals from one farm to another/abattoirs.

(c) Teachers should also use excursions and DVDs to help learners towards a deeper understanding of animal-handling facilities. The design features of the facilities (crush in this instance) are very important.

(d) In the teaching, learning and assessment of management practices to control parasite infestation, learners should be enabled to differentiate among chemical, mechanical and biological control measures. This should be infused into the informal assessment tasks.

QUESTION 4: ANIMAL REPRODUCTION

In 2015, this was the most poorly answered question. In 2016, the results were better. There were, however, cases of poor performance in many sub-questions.

Common errors and misconceptions

(a) Challenges were experienced in answering Q4.1.1, where candidates could not correctly write the units of semen concentration of dairy cattle: they wrote 6 ml instead of 6 million/ml. The number of sperm cells (in millions) was confused with the volume of semen (in ml).

(b) In Q4.1.2, candidates managed to score the total mark of 4; however, others were unable to comply with the principles of comparison. They compared the semen volume and semen concentration haphazardly. Some even included the beef cattle, which was not part of the question: as a result, they forfeited some or all of the marks.

(c) Candidates managed to score marks in Q4.2.1 (a) and (b), where an understanding of quality semen in relation to its colour was required; however, freshness of blood in semen was confused with injuries: some guessed, saying that injuries or diseases caused the red and grey colouring of semen, while others confidently associated grey colour with normal semen quality.

(d) Q4.3.1 was one of the questions where candidates scored full marks; however, differentiation between embryo transplantation and cloning still poses a challenge. Candidates could not analyse the question correctly. In Q4.3.2, some candidates wrote 'oestrus cycle', instead of 'oestrus', as a stage of the oestrus cycle.

(e) Challenges were evident in aspects such as correct identification of the types of twins. Some learners referred to non-identical twins as 'freemartin' (which is a hermaphrodite or imperfect sterile female calf which is the twin of a male calf whose hormones affected its development), while others wrote 'homologous' instead of 'monozygotic' twins.

(f) In Q4.5.1, learners labelled A, B and C instead of identifying the stage of birth indicated in the picture. They were also unable to provide 'dystocia' as a correct answer for Q4.5.2; those who managed to get it tended to spell the term incorrectly.

Suggestions for improvement

(a) In the teaching of the oestrus cycle, learners should be made aware that oestrus is just one stage (phase) of the whole cycle.

(b) It is advised that in the teaching of reproductive processes (cloning, embryo transfer and artificial insemination) as contained in the CAPS for Agricultural Sciences, teachers should ensure that the differences are clearly spelt out to eradicate misconceptions among learners. This should be reinforced through regular assessment and feedback to learners.

(c) In the teaching of multiple births, pictures, charts and videos should be used so that learners would be able to distinguish multiple births from freemartin.

3.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

GENERAL COMMENTS

(a) Candidates performed slightly better (10%) than they did in 2015 in question 1, mainly in the multiple choice sub-question.

(b) Questions on cash flow budget, net worth and net cash income in question 2 proved to be a serious challenge to candidates.

(c) Candidates struggled with data response questions, particularly in question 3.

(d) Basic genetics is still proving difficult for candidates as they struggled with the selection principle of heritability, environmental factors causing variation and genetically modified organisms (GMO).

General suggestions for improvement

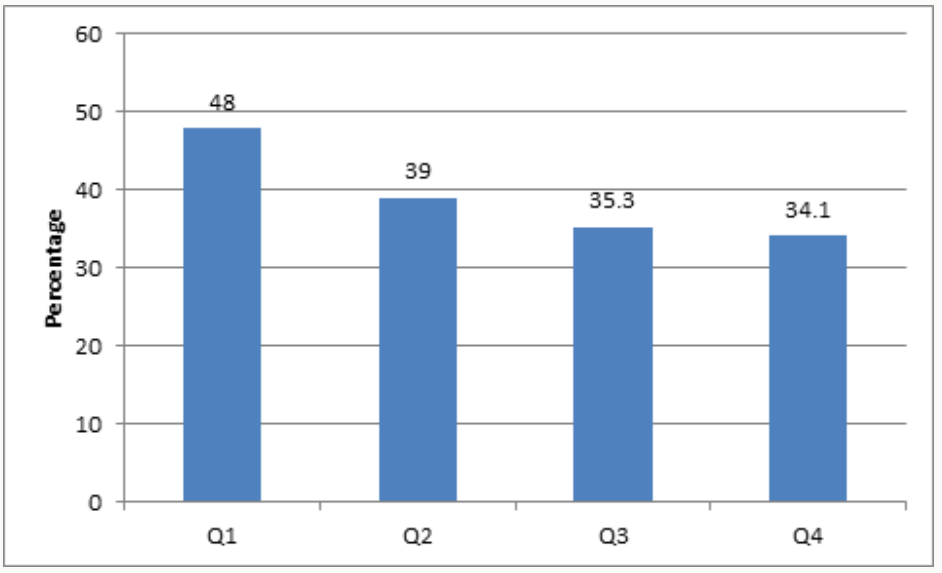
(a) As indicated in previous years' Diagnostic Reports, assessment tasks should contain data response questions so that learners develop the skill of interpreting data and responding accordingly.

(b) Informal assessment tasks should be set so as to help learners to develop the skill of being able to compare information, as was the case with comparing semen volume and semen concentration.

3.6. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

The following graph is based on data from a random sample of candidates. While it might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

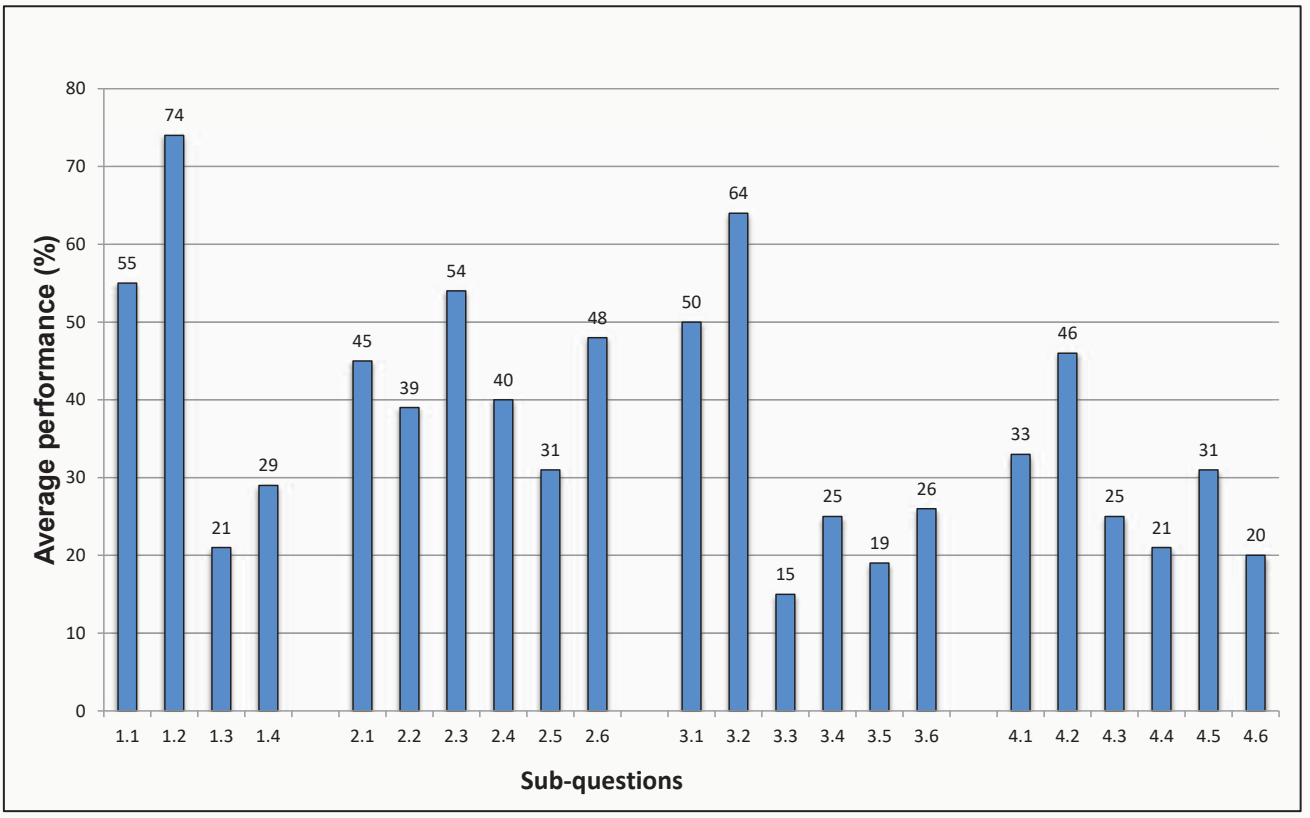
Figure 3.6.1: Average marks per question expressed as a percentage for Paper 2



Q1	Multiple choice, match type, terminology & replacement: Agricultural Management & Genetics
Q2	Agricultural management and marketing
Q3	Production factors
Q4	Basic Agricultural genetics

Candidates generally performed poorly in questions on basic genetics (genotypes, phenotypes, causes of variation, polygenic inheritance).

Figure 3.6.2: Average marks per sub-question expressed as a percentage for Paper 2



3.7. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 2

QUESTION 1: SHORT QUESTIONS (AGRICULTURAL MANAGEMENT & GENETICS)

This was the best-answered question. Since 2015, there has been a remarkable improvement in the quality of answers to this question. It should be noted, however, that some sub-questions were not well answered by candidates.

Common errors and misconceptions

(a) In Q1.1.4, candidates could not give the correct combination of statements applying to the supply and price of peaches in South Africa. Candidates responded randomly.

(b) In Q1.1.7, candidates could not give the correct combination of statements applying to the Labour Relations Act. They chose letters randomly.

(c) In Q1.1.10, candidates could not identify the correct word (inversion) for chromosome mutation from the given image/picture.

(d) In Q1.3, candidates were required to give one term for each of the descriptions. However, in Q1.3.3,

they struggled to provide the term 'breeding value' from the definition given. The same applied in Q1.3.5, where they could not identify 'inbreeding depression'.

(e) In Q1.4, candidates failed to provide substitutes for the underlined words. As a result, they struggled to replace 'labour fatigue' with 'labour productivity' as a term for the amount of work performed relative to the amount of money spent in Q1.4.2. In Q1.4.3, candidates failed to replace the term 'electroporation' with 'lipofection' when asked about the technique that involves using fats as carriers through the cell membrane into the nucleus.

Suggestions for improvement

(a) As indicated in Paper 1, learners should be explicitly taught the subject terminology to ensure that they are well acquainted with essential terminology. A glossary of terms should be made available to learners. Incorrect spelling of terms should be penalised and corrected through feedback so that learners are encouraged to provide correct subject terms and concepts in order to be able to differentiate between them.

(b) Assessment of terminology could be made interesting for learners through the introduction of speed tests on crossword puzzles, matching items, one-word answers and multiple-choice items that can be incorporated into daily teaching.

(c) Learners need to be tested informally on a regular basis on items from a glossary so that they are given additional and regular exposure to the relevant subject terminology.

QUESTION 2: AGRICULTURAL MANAGEMENT AND MARKETING

Candidates performed significantly better in this question than they did in 2015. However, answers to sub-questions on terminology were poor. This could be attributed to an increase in the number of data-response items in this question.

Common errors and misconceptions

(a) In Q2.1.1, most candidates failed to identify the functions of marketing in each of the statements given. Candidates struggled to match the given statements with specific terms.

(b) In Q2.2.4, responses of candidates indicated that there was still an inability to read, understand and compare scenarios as they could not give the correct marketing strategy as was intended by the question. It further indicates that candidates could not clearly distinguish between a marketing strategy and an approach. As a result, they failed to provide the benefits of the marketing strategy in Q2.2.5.

(c) Candidates could not formulate the hypothesis in Q2.3.1. They confused the hypothesis with the aim of the experiment and in some instances research questions.

(d) In Q2.4, candidates struggled to identify the advertisement dealing with eco-labelling and sustainable agricultural marketing. They confused sustainable marketing with approaches to marketing such as niche, mass and multi-segment marketing. Most learners gave the latter approaches as answers. They failed to correctly give sustainable marketing as the relevant approach in Q2.4.4.

(e) In Q2.5.1, candidates wrote statements instead of letters. This showed the inability to follow instructions in the question paper.

(f) Candidates performed poorly in Q2.5.2 since they thought they should give more advanced answers than simply writing the statement that corresponds to strength and opportunity.

Suggestions for improvement

(a) Teachers are once again advised to regularly expose learners to data response questions in their assessment as these types of questions will encourage learners to be creative in thinking of valid responses. However, teachers must make learners aware that their responses must be valid, based on fact, and, in line with the requirements of the question. Use of data response questions in assessing various approaches to marketing will benefit learners a great deal.

(b) One of the skills assessed in Agricultural Sciences as a science subject, is hypothesis testing. It is therefore advisable for teachers to include hypothesis formulation in their assessment tasks to reinforce this skill.

(c) Teachers should focus on all aspects of the content as listed in both the CAPS and the Examination Guidelines for Agricultural Sciences. There might be topics that have not been covered in recent question papers, but they remain important content topics to be taught holistically.

(d) Regarding data response questions, teachers are advised to expose learners to these types of questions in the classroom and encourage them to be creative in thinking of appropriate and valid responses. However, teachers must make learners aware that their responses can only be valid if it is based on fact, and, in line with the requirements of the question.

QUESTION 3: PRODUCTION FACTORS

Performance in this question was below average, even though there were instances of exceptionally good answering of some sub-questions. The poor performance could be attributed to the inability of candidates to respond appropriately to follow-up questions.

Common errors and misconceptions

(a) It is pleasing and encouraging to see that most candidates attempted to draw a graph in Q3.1.1. There are however, those that are still struggling with being able to correctly identify and label variables.

(b) Candidates found it difficult to relate the economic characteristics of land to the situations given on the graph. Some candidates confused functions of land with the economic characteristics of land in Q 3.1.2; subsequently, they were not able to describe how the characteristics relate to agricultural production.

(c) In Q3.2.3, candidates were challenged by labour legislation. They could not identify them from the scenario and even those who managed to do so could not write them out in full.

(d) In Q3.3, candidates found it very difficult to provide methods to be used by farmers to increase labour productivity.

(e) Most candidates struggled with Q3.4.1 on the drawing of a mini-cash-flow budget to determine the net cash of different periods.They struggled to list income from expenditure and did not know the formula to be used in calculating net cash in Q3.4.2.

(f) Candidates also struggled to identify the problems associated with capital from the statements that were given in Q3.5.

Suggestions for improvement

(a) As indicated in the 2015 diagnostic report, informal assessment tasks are developmental in nature. It is recommended that such tasks be administered on a regular and consistent basis so that learners are

taught to link concepts, characteristics and functions to the situations provided. Furthermore, functions and characteristics of land should be studied with concrete examples so that learners are not tempted to confuse the two.

(b) In the teaching, learning and assessment of labour as a production factor, all aspects pertaining to labour (term, types, problems, increasing labour productivity, legislation and labour contract) should be considered. The same should apply to capital (all aspects as in the CAPS policy document).

(c) In the teaching of net cash income, cash flow and all other accounting concepts, it is still highly recommended that there be co-operative teaching with the Accounting teachers for better comprehension and understanding of these Accounting concepts.

QUESTION 4 : BASIC AGRICULTURAL GENETICS

Performance in this question showed a lack of knowledge and understanding of basic genetic terminology. The performance of candidates in this question suggests that there was serious misinterpretation of genetic concepts by candidates.

Common errors and misconceptions

(a) In Q4.1.4, candidates confused parents in the genotypic crossing. They could not differentiate between genotype and phenotype; hence they struggled to differentiate between genotypic and phenotypic ratio in Q4.1.5.

(b) In Q4.2.1, candidates could not identify characteristics that could be selected for breeding; instead, they gave those with a heritability of less than 50% (lean meat and birth weight). They subsequently could not provide the relevant justification in Q4.2.2.

(c) In answering Q4.3, most candidates struggled to indicate the specific environmental factors causing variation, and mentioned only the classification of these factors. They failed to link environmental factors to the given statements.

(d) In Q4.4, candidates had no clue about polygenic inheritance. They failed to indicate the production of leghorn with BbGgkk genes in 4.4.1 and could not provide the genotypes resulting in 90 eggs as required in Q4.4.2.

(e) In Q4.6.1, candidates' responses reflected that they still struggle to differentiate between genetic engineering (process) and genetically modified organisms (product).

(f) Most candidates performed poorly in Q4.6.3 on socio-economic factors. They confused socio-economic issues with health issues. Candidates also confused the advantages of genetic modification with socio-economic and health issues. They wrote about the general advantages of GM and not the specific socio-economic effects on the farmer of food from the genetically modified plants.

Suggestions for improvement

(a) As indicated in the 2015 diagnostic report, teachers should in their teaching, pay special attention to a basic crossing, genetic concepts and terminology in their teaching of basic genetics. Teachers should make sure that learners are able to clearly differentiate between a genotype and a phenotype, as prescribed in the CAPS policy.

(b) It should still be emphasised that the key to mastering basic genetics is through the understanding of

terminology. Learners should be able to describe concepts and provide practical examples to illustrate their understanding of the terms and concepts.

(c) Emphasis should be given to the pattern of inheritance that leads to different genotypes: incomplete dominance, co-dominance, multiple alleles, polygenic inheritance and epistasis. It should also include the external (environmental) and internal (genetic) causes of variation.

(d) The teaching of genetics should be enhanced by providing practical examples within the learning site, such as plants, flowers and livestock. There should also be integration with Life Sciences, as genetics is taught comprehensively in Life Sciences.

(e) In the teaching of selection, the general principles (heritability and biometrics) must be emphasized using creative teaching strategies with learners. The issue of heritability is crucial in selection. Learners should be able to interpret both heritability and biometrics to demonstrate their knowledge of these general principles.

CHAPTER 4: BUSINESS STUDIES

The following should be read in conjunction with Business Studies question paper of November 2016 examination.

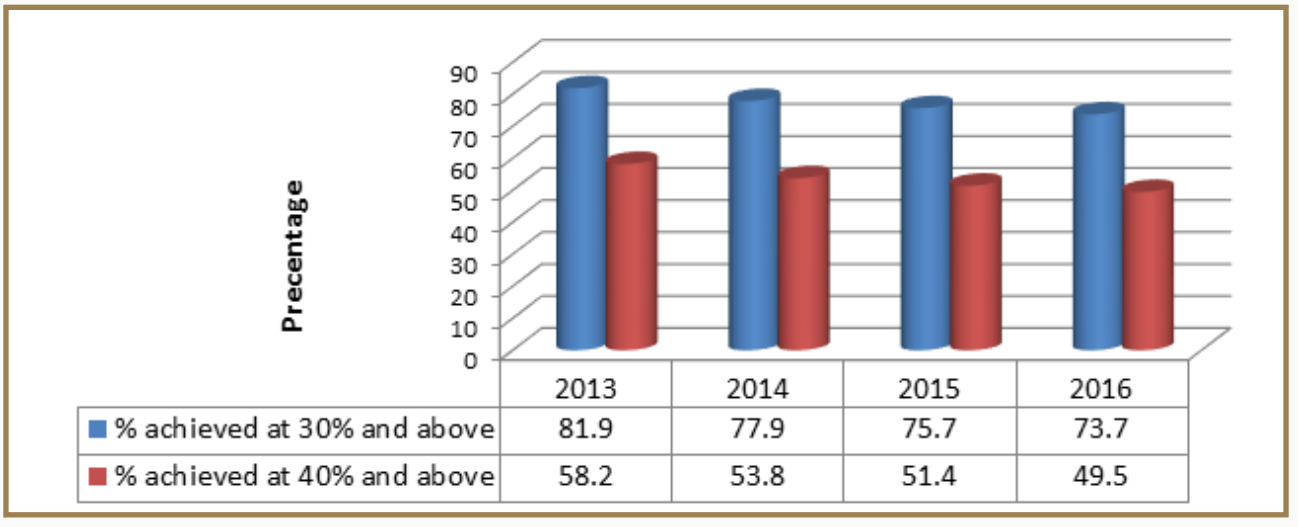
4.1. PERFORMANCE TRENDS (2013 – 2016)

In comparison to that of 2015, the number of candidates decreased by 12 898. The general performance of candidates declined this year, as indicated by 73,7% of candidates achieving at 30% and above, with 49,5% achieving at 40% and above.

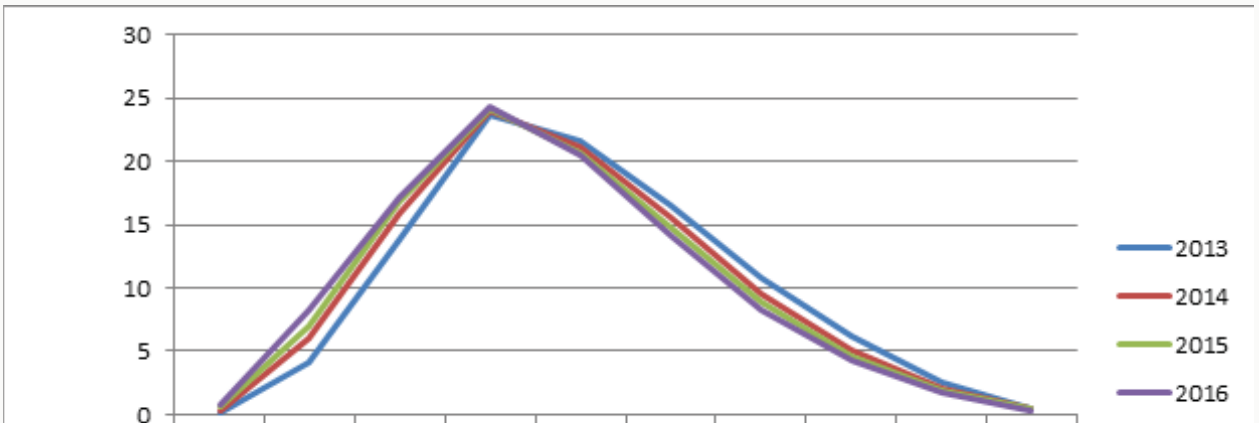
Table 4.1.1 Overall achievement in Business Studies

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	218 914	179 329	81.9	127 422	58.2
2014	207 659	161 723	77.9	111 743	53.8
2015	247 822	187 485	75.7	127 453	51.4
2016	234 894	173 195	73.7	116 225	49.5

Graph 4.1.1 Overall achievement in Business Studies



4.1.2 Performance distribution curve in Business Studies



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.2	4.1	13.8	23.7	21.6	16.5	10.8	6.2	2.6	0.5
2014	0.3	6.1	15.8	24.1	21.2	15.6	9.5	5.0	2.1	0.4
2015	0.6	6.9	16.8	24.2	20.7	14.8	8.9	4.6	1.9	0.4
2016	0.9	8.2	17.2	24.3	20.5	14.2	8.3	4.4	1.8	0.4

From the graph above, it is evident there has been a decline in the performance of candidates since the implementation of CAPS in 2014.

4.2. OVERVIEW OF LEARNER PERFORMANCE

General comments

(a) Due to a lack of understanding of the requirements of particular cognitive verbs, many candidates misinterpreted questions. Key verbs such as quote, identify, justify, discuss the impact, analyse, recommend or suggest ways, and distinguish were problematic to many candidates. Some candidates tended to name items without explaining or discussing them. They could not always quote from the scenarios and only included key words or their own summaries based on information in the scenarios. Some candidates could not respond to lower order questions with a high level of difficulty, such as Q2.3, Q4.2.1 and Q5.1.1.

(b) Candidates performed poorly in four sub-topics that were assessed for the first time in this paper after the implementation of CAPS. It appears that these topics were either not adequately assessed in accordance with the Annual Teaching Plan (ATP) or were merely taught and learnt from past NSC exam papers. Adequate resources for these topics may not have been readily available.

(c) Candidates performed well in multiple choice questions (Section A). However, their performance varied from average to poor in Section B, and good to average in Section C essay questions. It was evident that some candidates were unable to address the specific requirements of the questions and unable to read and interpret scenarios.

(d) Although there was a slight improvement in the presentation of essay type answers, some candidates still experienced difficulty in answering such questions. Many candidates were able to use the appropriate structure, but lacked content knowledge to address the topic or sub-topics assessed through the essay question. This resulted in poor to average performance in essay questions. The 'originality' marks (2)

could not always be awarded, as candidates either did not support their arguments with relevant or original examples, or could only supply examples from the scenario given in the questions.

(e) Many candidates could not present responses which would have earned them full marks, as they could not always elaborate on a fact to illustrate insight where required. Some candidates did not correctly number questions in Section B and Section C. They were severely penalized in Section B when their responses were not linked to the question/sub-question numbers as indicated on the question paper.

(f) Many candidates did not show an understanding of business concepts or were not able to apply these concepts in the correct context, e.g. diversity issues and induction.

General suggestions for improvement

(a) Learners must be taught the meaning of the essential action verbs that indicate the level of cognitive demand in questions. In order to do this, teachers are referred to the CAPS, Annual Teaching Plan (ATP), Examination Guideline (EG) and NSC examinations from November 2014 to date. Learners may make good use of past marking guidelines in conjunction with past question papers. However, it should be noted that, although past questions may cover the same content, they may have different foci, e.g. the answer to '*discuss the impact*' will include positive and negative facts, but '*discuss the positive impact*' only requires positive responses. Informal and formal assessment methods should also consist of lower order questions with a high level of difficulty so that learners can acquire skills of answering these questions.

(b) Teachers should refrain from relying only on past NSC papers during formal and informal assessment as it may limit their own creativity in finding new ways of asking questions. Subject advisors and coordinators should develop additional resources for CAPS topics that were not previously assessed in NSC papers.

(c) Educators should ensure that teaching and learning takes place within the scope of CAPS, ATP, the 2015 EG and relevant learning, teaching and support material (LTSM) that addresses the core content. Where CAPS content is not adequately covered in text books, teachers should ensure that text books are supplemented with extra notes.

(d) Teachers should aim to make use of recent and relevant scenarios, in order to provide learners with experience in answering questions based on topical issues. Scenarios should form an integral part of teaching and learning to enable learners to identify, quote or extract relevant information from scenarios in order to improve their performance in answering source-based questions.

(e) Controlled tests and examinations should be in line with the structure of the NSC paper, as per Circular S7 of 2013. This will give learners the opportunity to become familiar with answering direct and indirect questions in both Section B and Section C. Pertaining to essay questions, guidance should be given on including facts that are relevant to the topic in the introduction and conclusion without repeating these facts in the body of the essay. Candidates should also refrain from merely repeating the question in the introduction. Current business news should form part of daily teaching, so that learners will be able to support their arguments with original and relevant examples.

(f) Learners must be encouraged to write full sentences and provide clear explanations to achieve full marks on any question. Teachers should apply the correct method of marking in their assessment of tasks to encourage learners to engage with questions in the appropriate way. It is essential that learners understand how to analyse and comply with the requirements of questions in Section B and Section C. Teachers are advised to read and interpret the requirements of questions with their classes from time to

time so that learners can acquire this skill.

(g) Teachers must refer to November 2016 NSC paper and the Mind the Gap guide (including the 'Notes to markers' number 13.1 and 13.2) to advise learners on matters that could affect their performance in future. These matter include an understanding of the allocation of marks and part-marks, the importance of addressing the requirements of questions and the awareness of action verbs.

(h) Learners must be encouraged to number questions correctly as they will be penalized for incorrect numbering of their answers in both formal and informal assessment.

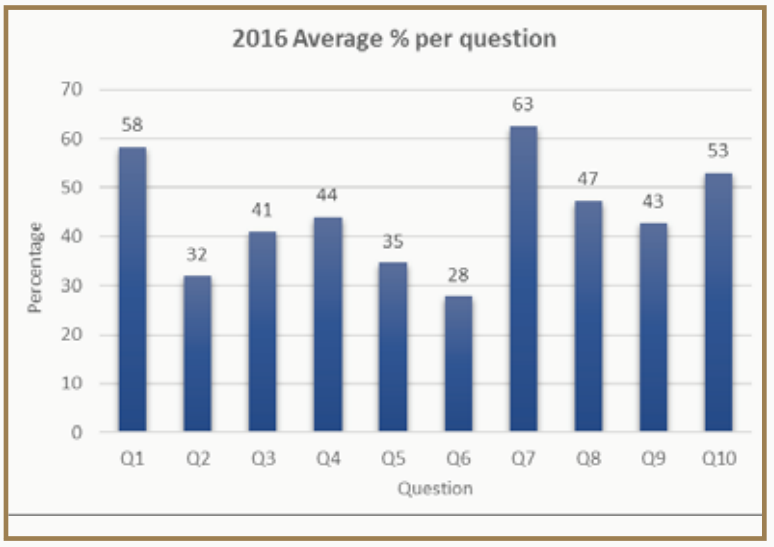
(i) There needs to be a greater emphasis on the learning of appropriate terminology related to the various topics. Teachers should use the following strategies to improve the teaching of terminology:

- Illustrate the meaning of new terms by using them in sentences and in short scenarios.
- Identify new terms in every lesson, write them on the board and elaborate on the meaning and context of each.
- Encourage learners to be attentive during lessons, to spot new terms and to find the meaning in a dictionary or textbook. This may form the basis of an informal class 'competition'.
- Learners should compile a glossary at the back of their notebooks i.e. a list of new terms per topic, with a brief, but clear definition next to each term. A separate note book for this purpose may also be kept. Ensure that by the end of the year, all learners have a comprehensive glossary of all the relevant terms.
- Include Business Studies terminology in all informal assessment tasks on a daily basis.
- The distinction between challenging or confusing terminology could be illustrated or explained on class posters so that learners could be exposed to this on a regular basis.

4.3. DIAGNOSTIC QUESTION ANALYSIS

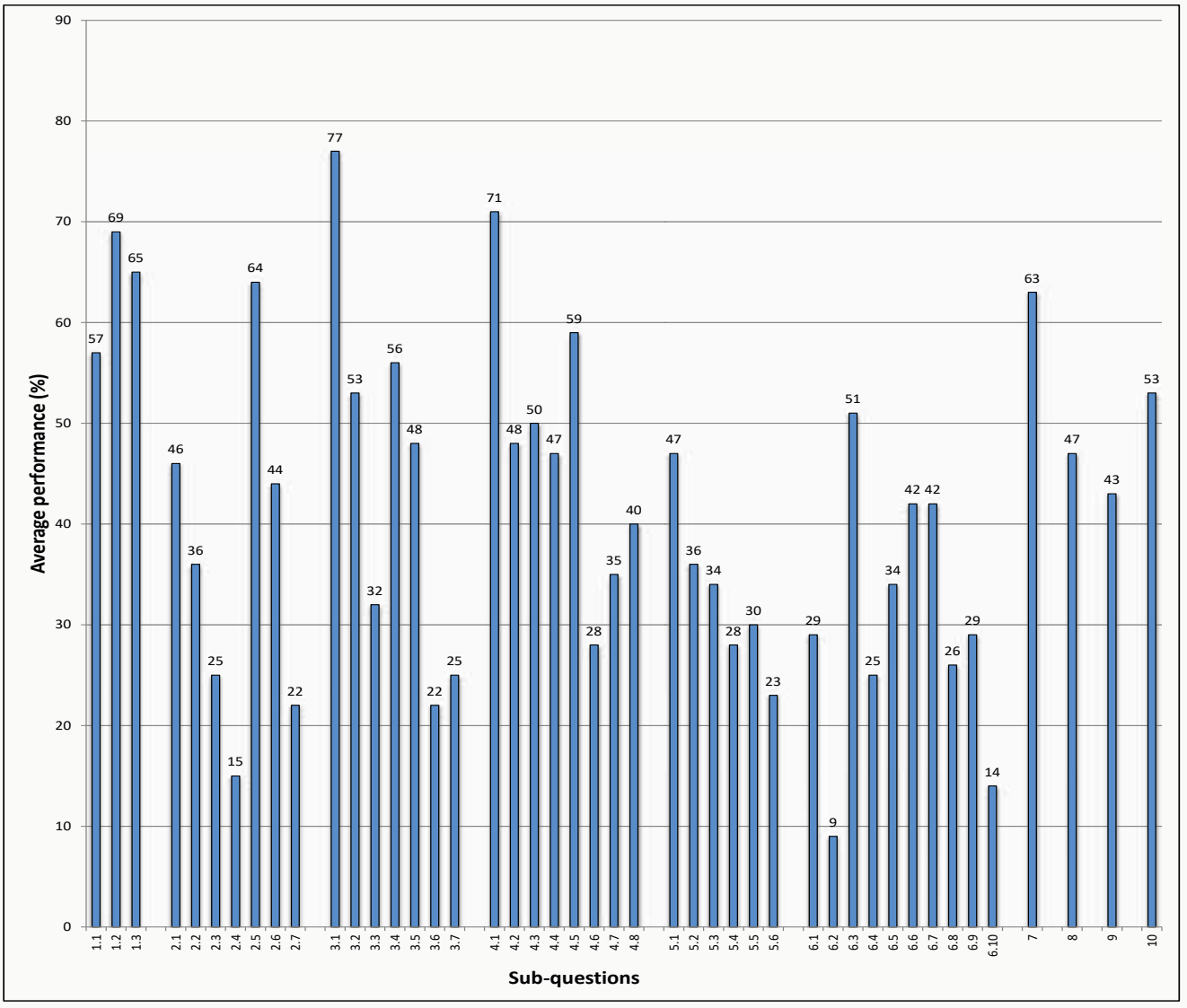
The graph below is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Graph 4.3.1 Average marks per question expressed as a percentage



Section A: Compulsory	
Q1	Compulsory (Multiple choice, choosing correct words and matching columns)
Section B: Choice questions (Any three)	
Q2	Business Environment
Q3	Business Ventures
Q4	Business Roles
Q5	Business Operations
Q6	Miscellaneous
Section C: Choice questions (Any two)	
Q7	Business Environment: Business strategies
Q8	Business Ventures: Management and leadership
Q9	Business Roles: Creative thinking
Q10	Business Operations: Human Resources

Figure 4.3.2 Average marks per sub-question expressed as a percentage



4.4. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS

SECTION A: MULTIPLE CHOICE/SHORT ANSWER QUESTIONS

QUESTION 1: COMPULSORY (MULTIPLE CHOICE, CHOOSING CORRECT WORDS AND MATCHING)

The performance of candidates in this question ranged from excellent to poor, with an average of 58%. Some candidates chose incorrect answers because they did not read the instructions and each sub-question carefully.

Common errors and misconceptions

(a) In Q1.1.9, many candidates were not able to associate or link 'quality circles' to the relevant TQM element. Quality circles may not have been properly taught in the context of TQM and the element of teamwork.

(b) In Q1.2.2, many candidates confused 'preference' shares with 'ordinary' shares.

(c) Many candidates confused 'fronting' with 'nepotism' in Q1.2.4.Candidates who were not familiar with these two terms, could not link the practical statement with the correct term and consequently resorted to guessing the answer.

(d) In Q1.3.4, candidates confused 'grievance' with 'dispute' even though a similar question appeared in past NSC papers. These concepts have always been a challenge since the inception of NSC and CAPS.

Suggestions for improvement

(a) Teach Total Quality Management (TQM) elements holistically and in the context of improving the quality of goods and services provided by businesses. Practical examples and short scenarios should form part of informal and formal assessments in consolidating knowledge on each TQM element.

(b) A clear distinction between the different types of shares should be explained with specific reference to the meaning of 'preference' and 'ordinary' shares.

(c) Learners should know the negative impact of each Act on businesses so that they are familiar with basic terms that are associated with each Act e.g. fronting is the negative impact of BBBEE on businesses.

(d) Teachers are advised to use practical examples or short scenarios that will help learners distinguish between a grievance and a dispute, and avoid confusion of these concepts. An employee could lodge a grievance with his/her immediate supervisor when he/she is unhappy with aspects in the workplace. A dispute is declared if the grievance is not resolved and will be lodged with the CCMA.

SECTION B: LONGER AND PARAGRAPH QUESTIONS, USING CASE STUDIES AND INFORMATION (THREE QUESTIONS TO BE ANSWERED)

QUESTION 2: BUSINESS ENVIRONMENT

The performance of candidates who attempted this question varied from average to poor, as content in this main topic tends to be abstract e.g. legislation and strategies. The average of this question was 32%.

Common errors and misconceptions

(a) In Q2.3, many candidates could not correctly identify the relevant consumer rights based on the short statements. It was the first time candidates were required to apply consumer rights to practical examples. Some candidates did not understand the requirements of the question and tried to classify the statements under the NCA or CPA or were unable to identify the consumer rights.

(b) Many candidates could not explain the difference between the National Skills Development Strategy (NSDS) and the Human Resources Development Strategy (HRDS) in Q2.4. They rather based their responses on the role of the human resources function or the advantages/purposes of the Skills Development Act. It appears that this sub-topic is not adequately taught or assessed during the academic year. In Q2.6, candidates listed the advantages and purpose of the EEA instead of explaining how businesses can comply with this Act.

(c) In Q2.7, candidates merely explained the BBBEE pillars rather than recommending the application thereof by business. Some candidates did not understand what is required by the verb 'recommend' and confused enterprise development with management.

Suggestions for improvement

(a) Learners should be exposed to a variety of questions related to consumer rights. They must be able to name, discuss, evaluate and identify consumer rights in given scenarios. The use of newspapers clippings, cartoons and case studies when teaching and assessing this topic is strongly advised.

(b) Differences between the National Skills Development Strategy (NSDS) and the Human Resources Development Strategy (HRDS) can be explained in terms of their objectives. NSDS focuses on the planning of skills development and training, whereas the HRDS is a broad concept requiring certain development strategies and programs to ensure the development of the full potential of human beings (via lifelong learning). Where textbooks are not clear on these strategies, teachers and subject advisors need to do research and compile clear class notes on these topics.

(c) Learners should not only be able to explain the various Acts in terms of their nature, purpose and impact, but also the compliance and penalties thereof. Compliance (and penalties) are the 'practical' part of the Act as businesses need to know what constitutes acceptable or legal compliance in terms of the Act, and what the consequences are when they do not comply.

(d) Teachers should use practical examples when teaching the BBBEE pillars. Cognitive verbs such as discuss, name, identify, analyse, suggest and recommend must form an integral part of the teaching and learning of BBBEE pillars. Case studies/Scenarios and short practical statements should be used when assessing these pillars. Teachers must emphasize the fact that there is the BBBEE Act of 2003 with seven pillars, and the Amended Act of 2013 where the pillars were combined and reduced to five. However, the implications of these pillars on businesses remain the same. Some text books may only cover the BBBEE Act of 2003; consequently, subject advisors and teachers should ensure that resources are available for both sets of pillars since CAPS lists both Acts.Special reference should be made of Enterprise Supplier Development (ESD) and management control, as these are the new pillars that replaced the old ones.

QUESTION 3: BUSINESS VENTURES

The average of this question was 41% as learner performance ranged from average to poor.

Common errors and misconceptions

(a) Some candidates could not outline the advantages of ordinary shares in Q3.3, and instead listed examples of preference shares. It appears that teaching and learning only focused on listing/naming the types of shares and not necessarily on the advantages/disadvantages of ordinary and preference shares as investment options.

(b) The calculations of simple and compound interest posed a challenge to some candidates in Q3.4. In many cases, learners applied the same formulae for Q3.4.1 and Q3.4.2. Many candidates could not use the relevant information from the scenario to determine the formula to be applied in the two sub-questions.

(c) In Q3.5.3, many candidates confused the factors to consider *when* presenting, with those factors to be considered *before* or *after* a business presentation. Presentations may not have been taught with the emphasis on processes *before*, *during* and *after* presentations.

(d) Many candidates either presented the qualities of a good entrepreneur/leader or suggested strategies

to improve leadership in Q3.6, instead of focusing on personal attitude in successful leadership. Some responses were general in nature.

(e) In Q3.7, candidates could not explain how management and taxation contribute to the success or failure of partnerships. Responses were mainly based on either the definition of the criteria in the question or the advantages of paying tax in general. Many candidates were not aware of the fact that partnerships do not pay tax, and that partners do so in their personal capacity on the profit earned from the business.

Suggestions for improvement

(a) Learners should be taught not only to name the types of shares but also to evaluate ordinary and preference shares as forms of investment. Teachers should illustrate the link between 'evaluate' and 'advantages', where evaluate requires positives/advantages and negatives/disadvantages. In this question only the advantages were required.

(b) The formula for calculating simple and compound interest should be taught in conjunction with that used by learners in Mathematical Literacy. This will eliminate confusion. Teachers need to clearly explain the meaning and implication of simple vs compound interest and when to apply the relevant formula. Practical scenarios similar to those in past papers should be used in consolidating calculations. Regular revision in dealing with calculations should be conducted to give learners the necessary confidence.

(c) Teachers should clearly distinguish between factors to be considered *before*, during and *after* a presentation. When making class notes on presentations three columns for before, during/while and after on one page should enable learners to understand the various processes of presentations. Learners must use full sentences when suggesting factors to earn full marks. Vague or one word answers should be avoided as it cannot be clearly linked to the *before*, *during* or *after* stages of the presentation. Verbs to be used when assessing presentations include: explain/discuss/outline/describe/suggest/recommend.

(d) Learners must know the impact of negative or positive personal attitude in successful leadership. Although learners will benefit from recognizing poor character traits in themselves and others, the emphasis should obviously be on the positive attitude of successful leaders. A positive attitude can be associated with key words such as good behaviour, desire to work and growth. Teachers must emphasize the fact that a positive personal attitude reaps success and that the characteristics of an entrepreneur or leader do not apply to this question. Rigorous class debates based on personal attitude will enhance learner understanding and insight.

(e) It is important that teachers recap the characteristics, advantages and disadvantages of each form of ownership before teaching the criteria that will contribute to the success or failure of each form of ownership. In so doing, learners will find it easier to explain how these criteria contribute to success or failure. It is also worth noting that the advantages and disadvantages of each form of ownership can be used as a starting point to explain how each criterion contributes to success or failure of the forms of ownership.

QUESTION 4: BUSINESS ROLES

This question was answered satisfactorily and learner performance ranged from excellent to poor. This was the most popular choice in Section B with an average of 44%.

Common errors and misconceptions

(a) In Q4.2.1, many candidates could not identify the diversity issues from the given scenario. Some candidates merely repeated the text in the scenario or wrote a motivation without identifying the relevant diversity issues.

(b) In Q4.3, some responses were general as candidates confused cultural rights with basic human rights. Some candidates explained cultural discrimination (negative) instead of focusing on promoting cultural rights (positive). This sub-topic was assessed for the first time in this question paper. It seems as if candidates either did not prepare well for this sub-topic or were not adequately assessed on this topic during the academic year.

(c) In Q4.4, some responses were based on employee wellness rather than safety measures in the workplace. Some candidates listed advantages of having the health and safety representatives in the workplace or referred to compliance with the provisions of COIDA. Candidates might not have been adequately prepared for this topic, as it was also assessed for the first time in this paper.

(d) In Q4.5.2, many candidates were not able to interpret the requirement of this question. Instead of recommending *other* ways to contribute to the well-being of employees, they presented other types of housing and stress reduction methods. No marks were awarded for these recommendations, as they were drawn from the information in the scenario and therefore not in accordance with the requirements of the question.

(e) Some candidates could not identify the stages of team development in Q4.6 and merely listed them in sequence instead of actually linking each to the relevant descriptor. Others confused the forming stage with the norming stage.

(f) In Q4.8, many candidates could only provide negative strategies to deal with employees who abuse work time instead of positive strategies to prevent workers from abusing work time.

Suggestions for improvement

(a) Teachers should not only define diversity, but explain diversity issues using practical examples. Learners should understand diversity as a concept (define/outline), identify workplace diversity issues (by means of practical examples or scenarios) and know how businesses should deal with these issues. Class debates and group discussions, focusing on the ways businesses could deal with each diversity issue will stimulate application and analytical thinking.

(b) Clear distinction should be made between different types of rights and their implications on businesses i.e. human, economic, social and cultural rights. Teachers should use practical examples on how businesses can promote these rights in the workplace. Learners must not only focus on language as the only strategy to promote cultural rights, but should take note of the context in which language and religion are used as examples of how businesses can promote cultural rights. Learners should be taught that businesses can allow employees to observe their cultural beliefs and holidays, but not to practise their culture in the workplace.

(c) Teachers can only teach the role of health and safety representatives once learners understand the concept of health and safety representatives. As this sub-topic has not been assessed before, subject advisors and teachers need to ensure that learners have adequate access to resources on it. Teachers could also refer to Grade 11 (term 3) content.

(d) The focus in teaching and learning should be on how businesses can contribute to the well-being of employees. Positive key concepts such as 'improve the quality of life', 'nutritional programmes' and 'team building' should be used to enable learners to elaborate on businesses' contributions to the well being of its employees. Teachers must ensure that learners do not confuse *employee well-being* with the *well-being of the community*. Teachers should also elaborate on how learners should respond when 'other' ways/methods are required in a follow-on question.

(e) Different cognitive verbs should be used when assessing the stages of team development e.g. name, explain, discuss, describe, identify and classify. Case studies and scenarios should be used to consolidate the required knowledge on the various stages. Learners must be discouraged from just referring to a number of a stage e.g. stage 1, 2, 3 or 4. This is regarded as a vague or incomplete answer and is not acceptable. Team stages should be taught and assessed thoroughly in Grade 11 so that these concepts can be recapped and adequately assessed in Grade 12.

(f) Teachers should ensure that learners are able to identify and explain unethical business practices e.g. abuse of work time, sexual harassment and pricing in rural areas. Learners should be able to explain reasons why these issues are regarded as unethical and unprofessional as well as recommend/suggest/devise strategies that businesses can use to deal with unethical business practices. Learners must be encouraged to recommend correctional, positive strategies that are developmental rather than punitive of nature.

QUESTION 5: BUSINESS OPERATIONS

The majority of the candidates did not perform well in this question despite the fact that many of the sub-questions appeared in past NSC papers. The average mark for this question was 35%.

Common errors and misconceptions

(a) In Q5.1.1, many candidates were not able to identify the components of job analysis even though these components are part of the recruitment procedure. Some candidates were not able to quote examples of job description and job specification from the scenario.

(b) In Q5.1.3, candidates confused the role of the interviewer in preparing for an interview with the role of the interviewee during an interview. Some responses inappropriately included the role of a presenter during a presentation.

(c) In Q5.3, candidates confused the benefits of a good quality management system with the quality indicators for general management. Although this question appeared in many past papers, candidates still misinterpret it. Many responses were vague and general in nature.

(d) Many candidates could not suggest relevant and clear quality indicators for the required business functions in Q5.5, although this question appeared in previous NSC papers and was taught in Grade 10 and 11.

(e) A number of candidates was not familiar with the PDCA model/cycle in Q5.6.3 as this was a new concept included in the 2015 Exam guideline. It was assessed for the first time in the 2016 NSC February/March paper.

Suggestions for improvement

(a) Teachers should explain the basic concepts of the recruitment process as well as the components in each procedure. Job analysis can only be successfully executed by compiling a clear job description (list of duties etc.) followed by a job specification (list of qualification and skills) based on the job description. Practical examples should be used to illustrate the differences between these concepts.

(b) Learners should clearly understand the concept of *interviewer* and *interviewee*. It is appropriate to use a two-column table with the role of interviewer in one column and that of the interviewee in the other column. The roles for both parties in *before* and *during* the interview should be divided in separate rows. Role play should also enhance learners' understanding and insight in these roles. Please note that responses such as 'dress code' and 'research on the business' will not be accepted as roles of the interviewee *during* the interview.

(c) Benefits of a good quality management system should be presented from the business point of view and not that of their employees. Learners must be encouraged to write full sentences to earn good marks. Positive aspects such as customer satisfaction, increased productivity, competitive advantage, goal achievement and increased market share should be used in full sentences. Quality management systems include everyone in the business and not just general management.

(d) Teachers should not only focus on the elements of TQM (Total Quality Management) and quality concepts when teaching Business Operations (main topic). It is imperative that learners also know quality indicators for each business function and how these indicators can contribute to the success or failure of the business. Quality indicators are plans/strategies that are implemented, monitored and executed to ensure quality in the respective business department or function. These are practical of nature.

(e) Teachers should ensure that the PDCA mode/cycle is taught in detail and in context of the TQM element of the continuous improvement to processes and systems. As the PCDA model/cycle may not be covered in all the text books, teachers and subject advisors should ensure that clear, explanatory notes are available to all learners.

QUESTION 6: MISCELLANEOUS

This question covered all four main topics. This posed a challenge to many candidates who did not study the entire curriculum. Responses ranged from fair to very poor and the average on this question was 28%.

Common errors and misconceptions

(a) In Q6.1.2, candidates who were not well conversant in legislation, focused on 'discrimination' rather than on the non-compliance to COIDA.

(b) In Q6.2, candidates confused the strategic management process with the problem solving steps, despite the fact that question appeared in two past NSC papers.

(c) Many candidates could not tabulate their responses in Q6.5. and could not clearly link the differences between the private and public companies. Some candidates gave similarities while others confused public companies with state-owned companies. It appears as if candidates did not study or recap the characteristics, advantages and disadvantages of each form of ownership as required in the Grade 12 ATP.

(d) In Q6.10, several candidates could not link TQM to cost reduction of quality as they lack knowledge in the application of TQM on business operations and can therefore not indicate how the cost of quality can be reduced. Responses were either vague or irrelevant.

Suggestions for improvement

(a) 'Discriminatory actions' in terms of an Act can only be taught if learners understand and know the legal provisions of the Act. Provisions are legal actions (positive) within the parameters of the Act, whereas discriminatory actions are illegal and negative. A variety of practical scenarios and case studies should be used to teach and assess legal and illegal business actions.

(b) Businesses need to formulate relevant business strategies that will enable them to address the challenges of the business environments. The strategic management process is done to scan both the internal and external environments. Learners must know that the strategic management process consists of a range of steps or procedures and is not just the implementation of a strategy.

(c) Teachers should ensure that characteristics of each form of ownership are thoroughly taught and consolidated in Grade 10 and 11 so that it can be recapped in Grade 12. The requirements for the action verb 'tabulate' should also be emphasized and applied in class work, and formal and informal assessment. It requires learners to only show differences in characteristics that are linked, e.g. the name of a private company ends with '(Pty) Ltd', whereas the public company's name ends with 'Ltd'. The link here relates to the naming requirements for companies.

(d) Learners should be able to give practical examples of how TQM can reduce the cost of quality if they are properly informed about the meaning and implication of TQM. The emphasis in learner responses should be 'how'(practical actions) to reduce the cost of quality and not on the advantages/ benefits of TQM. Learners must know that TQM involves all business functions and not only one function e.g. the production function. Practical examples and short scenarios will support the teaching of these cost-reducing measures.

SECTION C: ESSAY QUESTIONS (TWO QUESTIONS TO BE ANSWERED)

QUESTION 7: BUSINESS ENVIRONMENT: BUSINESS STRATEGIES

This was not a popular question, but candidates who attempted this question performed well to average, as indicated by the average of 63%. The question contained four bulleted sub-questions of which only one was asked for the first time i.e. the effectiveness of intensive strategies. Provision in the memorandum was made for mentioning the types of intensive strategies in terms of the context in which these strategies were discussed.

Common errors and misconceptions

(a) Although many candidates could name Porter's five forces, they could not clearly explain each force. Some candidates merely provided one-word names for some forces, which were not accepted as it could point to the components of the market environment.

(b) Many candidates could not discuss the effectiveness of intensive strategies, and only explained the types of intensive strategies. It appears that candidates did not understand the meaning of 'effectiveness' hence they misinterpreted this question.

(c) Several candidates confused the steps in evaluating a strategy with problem-solving steps. Numerous candidates who answered this question only gave one word or vague answers.

Suggestions for improvement

(a) Learners should know the meaning of each force i.e. define the force and explain how businesses use it to analyse their position in the market environment. Practical examples should be used to explain each force e.g. buyers who buy in bulk have more power to dictate the terms and conditions of sales (power of buyers). Teachers must discourage learners from giving one word answers when naming the five forces.

(b) Teachers should teach the different types of strategies using practical examples of each. Once learners understand each strategy, they will be able to discuss or explain its effectiveness. The effectiveness or advantages of a strategy is imbedded in the reason(s) why businesses use it successfully.

(c) A clear distinction must be made between the steps in evaluating a strategy and the problem-solving steps. Learners should compare the two sets of steps in a two column table and identify similarities and differences. Teachers should elaborate on the nature and context of the steps or process in evaluating strategies. It should be noted that the main aim of strategy evaluation is to select the best strategy that will address the business challenges. On the other hand, problem-solving steps are obviously relevant to finding solutions to the problem.

QUESTION 8: BUSINESS VENTURES: MANAGEMENT AND LEADERSHIP

This question was a popular choice in Section C. Performance ranged from average to fair, with an average of 47%.

Common errors and misconceptions

(a) Many candidates could not construct proper introduction and conclusion statements and merely copied from the given scenario.

(b) Several candidates could not discuss the situational and transformational leadership theories. Some candidates only wrote one sentence on each theory, while others linked transformational leadership to changing a person rather than managing change in the business.

(c) Most candidates could only suggest one situation in which the autocratic and transactional leadership styles could be applied.

Suggestions for improvement

(a) Teachers need to use more than one resource when teaching essay-type questions. Learners must be taught how to construct relevant factual statements to introduce or conclude the essay type question. Copying from the question should be discouraged as it earns no marks and tends to waste time.

(b) Learners should know that leaders will apply situational leadership so that they are able to adjust their leadership style to manage the prevailing situation or task. Teachers should provide detailed information of each of the three leadership theories. Learners must only discuss these theories and not the impact and application thereof.

(c) Teachers should use different examples of situations in which each leadership style can be applied when teaching and assessing leadership styles and theories. Some of these examples should also illustrate the advantages of these leadership styles. Learners will not be awarded marks if they repeat the same examples under the application. Learners should be regularly exposed to practical case studies and scenarios in informal and formal tasks.

QUESTION 9: BUSINESS ROLES: CREATIVE THINKING

Although this question was a popular choice, responses ranged from average to poor, with an average of 43%. The question consisted of four sub-questions that were all asked in previous NSC exams.

Common errors and misconceptions

(a) Many candidates could not differentiate between decision-making and problem-solving. They simply wrote the steps in problem-solving without providing a clear distinction between the required concepts.

(b) The nominal group technique was confused with brainstorming or the empty chair techniques. Some candidates demonstrated limited understanding of the Delphi technique as they indicated that employees rather than experts must complete questionnaires. Other candidates could not apply these techniques and merely listed advantages and disadvantages of the techniques.

Suggestions for improvement

(a) Learners should be able to differentiate between decision-making and problem-solving. Decisions are usually made by one person after critically evaluating or considering various alternatives and problem-solving is done by team members who generate solutions and critically evaluate it before choosing the best solution for a problem. Learners must be advised not to write the steps in problem-solving when they are required to distinguish it from decision-making.

(b) Teachers should use practical examples, demonstrations and role play when teaching the application of problem-solving techniques in the workplace or business. Learners must not confuse brainstorming with the nominal group technique, where team members or employees are divided into smaller groups before they are requested to *silently* brainstorm many ideas on their own before sharing it in their small groups (the term 'nominal group' relates to this). The technique of brainstorming does not require division into small groups and ideas are generated *aloud* while team members or employees work together to generate as many ideas as possible.

(c) It is imperative that teachers revise these problem-solving techniques to assess learners' understanding and close the gap between Grade 11 and Grade 12 content.

QUESTION 10: BUSINESS OPERATIONS: HUMAN RESOURCES

The responses of candidates who answered this question ranged from average to poor, with an average of 53%. This question consisted of five sub-questions (with two imbedded in the first bullet).

Common errors and misconceptions

(a) Although some candidates were able to explain the purpose of induction and state aspects to be included in an induction programme, many candidates confused the purpose of induction with the benefits or advantages thereof.

(b) Many candidates confused the placement procedure with the recruitment or selection procedures.

(c) Candidates could not discuss the implications of the Skills Development Act (SDA) on the human resources function. They either wrote the advantages or purpose of the SDA. Some candidates were not familiar with the requirement or the meaning of 'implications'.

Suggestions for improvement

(a) Teachers should inform learners how to distinguish between the purpose or reason for induction and the benefits, advantages or positives of induction. A two-column table could be helpful to clear the confusion. Teachers should avoid creating the impression that purpose and benefits are similar. Learners also tend to be less confused if they understand the concept of induction in the context of all the other human resource activities.

(b) The placement procedure is done after a new employee has been successfully completed the induction processes. Learners must know that businesses use the information obtained from the job description and job specification to match the new employee's strengths, weaknesses and skills with the requirements of the new job or position.

(c) Teachers should take cognisance of the fact that the human resources manager does not train employees, but must take the responsibility to implement all the provisions of the SDA. Learners must not confuse this implication with the advantages and purpose of the SDA. Human resources managers coordinate the training and upskilling process by identifying training needs of employees and could appoint a skills development facilitator to physically conduct training sessions.

CHAPTER 5: ECONOMICS

The following report should be read in conjunction with the Economics question papers 1 and 2 of the November 2016 Examination.

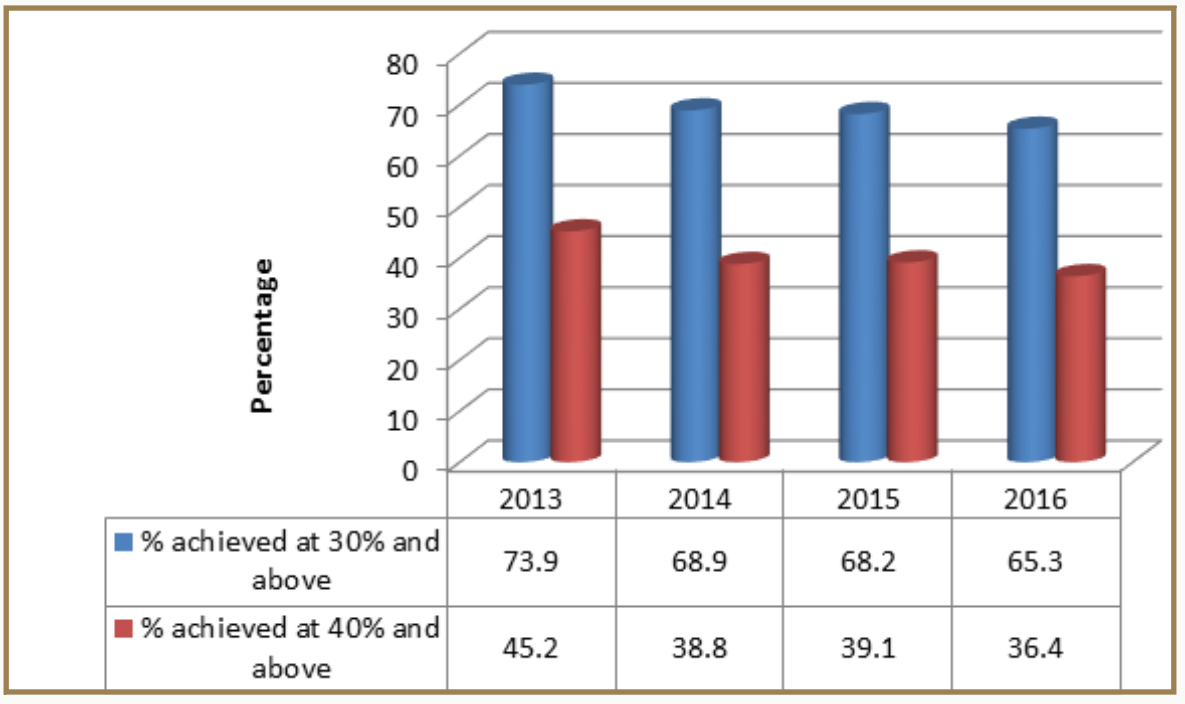
5.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates decreased by 9 715 in comparison to that of 2015. The general performance of candidates declined slightly this year as indicated by 65,3% of candidates achieving at 30% and above, with 36.4% achieving at 40% and above.

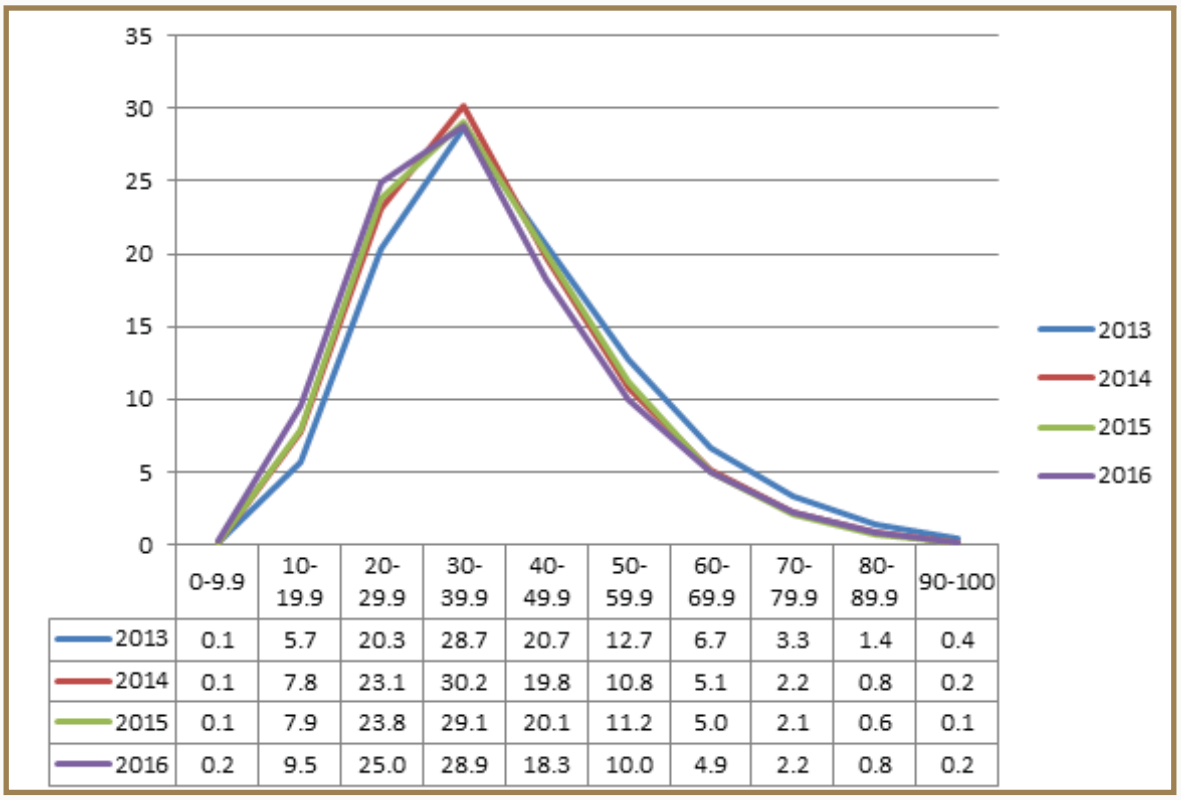
Table 5.1.1: Overall achievement rates in Economics Papers 1 & 2

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	150 114	110 869	73,9	67 795	45,2
2014	137 478	94 779	68,9	53 294	38,8
2015	165 642	112 922	68,2	64 780	39,1
2016	155 908	101 787	65,3	56 794	36,4

Graph 5.1.1: Overall achievement in Economics Paper 1 & 2



Graph 5.1.1: Performance distribution curves in Economics



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.1	5.7	20.3	28.7	20.7	12.7	6.7	3.3	1.4	0.4
2014	0.1	7.8	23.1	30.2	19.8	10.8	5.1	2.2	0.8	0.2
2015	0.1	7.9	23.8	29.1	20.1	11.2	5.0	2.1	0.6	0.1
2016	0.2	9.5	25.0	28.9	18.3	10.0	4.9	2.2	0.8	0.2

From the above graphs, it is evident that there has been a decline in the performance of candidates in the past three years.

5.2. OVERVIEW OF LEARNER PERFORMANCE: PAPERS 1 & 2

General comments

(a) It is evident from better centres' performance that candidates had a solid understanding of tables, graphs, extracts, news articles and figures on a regular basis. Candidates were able to finish within the time limit of 2 hours.

(b) The poor quality of answers in many centres indicated that problems still exist in the teaching and learning processes. The main reasons for underperformance were the following:

- Poor language skills made it difficult for learners to express themselves, especially in paragraph type questions, which formed a large part of the question paper;
- Most learners were not prepared to solve problems, give their own opinions, or evaluate data connected to their study material;
- Candidates seem to lack basic knowledge of the general economic issues of the day.

(c) Judging from the performance of candidates in the 2016 papers, the general performance or lack thereof resulted from the following:

- **Content coverage**: Candidates from centres that performed well had been exposed to the entire curriculum. These candidates were able to make sound choices between questions in Section B and Section C. However, it is evident from the poor performance of many candidates that they were not exposed to the details prescribed by policy and discussed in the *2014 Examination Guidelines*. Basic economic concepts/terminology seemed to be lacking among many candidates and there was a lack of knowledge on current economic topics. For example:

  i In Paper 1: Q2.3.3 Briefly describe the term dumping; Q4.3.3 What impact will a downgrading of South Africa's credit rating have on its economy?

  ii Paper 2: Q3.1.1 Name any TWO millennium development goals that form part of international agreements that ensure a sustainable environment.

- **Exposure to different types of questions**: Skilled learners can write essays and paragraphs and offer their opinions with confidence. These learners have the ability to focus on the information that is relevant to the answering of each question. Teachers play a crucial role in the moulding of their learners to deal with a variety of questions with different cognitive verbs such as *why, how and what* and the unlocking of knowledge in a variety of ways. A variety of higher-order thinking skills should be developed in the context of the subject content being taught. Learners should be challenged to solve everyday problems experienced in their own communities. For example:

  i Paper 1. Q3.5: How does South Africa comply with various international bodies that require them to standardise their indicators? Q4.5 How will subsidies influence export-orientated businesses negatively?

  ii Paper 2. Q3.5. How will you advise the Minister of Tourism to overcome the impact of negative externalities generated by tourism?

- **Language ability**: Although language deficiency is still a drawback for many second-language candidates, many centres in deep rural areas have excellent results compared to others experiencing similar circumstances. Teaching should take place in such a way that learners understand the content.

General suggestions for improvement

Teachers are advised to build the following practices into the work plan for the year:

(a) **Use of past NSC/CAPS papers and CAPS exemplar papers:** In preparation for the 2017 year-end papers, every learner should use the past papers for the final examination (2014, 2015 and 2016) and supplementary examination (2015, 2016 and 2017) for clear guidance. Teachers should build their own confidence in their ability to deal with each topic in the classroom situation and to assist learners through their teaching. Furthermore, teachers should use the *Examination Guideline* and *Mind the Gap* as support material when it comes to the scope and depth of content and how to assess learners' understanding of the specific content matter. In cases where old question papers are used for teaching and learning, they should be CAPS compliant and aligned to the changes made in the Examination Guidelines. Using previous marking guidelines is good as a revision tool but not as a teaching tool. Interpretation of questions is critical; content should continually be assessed in line with the *Examination Guidelines*.

(b) **Basic concepts:** Teachers should ensure that learners understand basic concepts and terminology before engaging in their applications. More time should be spent to improve the reading skills of second-language learners. Learners' understanding of terminology should be assessed on a continuous basis. *Mind the Gap* explains all relevant concepts in detail. A quiz bowl, crosswords or team challenges can be interesting tools to assess knowledge of economic concepts. Classwork or homework on definitions would ensure that learners stay familiar with these basic concepts.

(c) **Requirements of questions:** Teachers should ensure that learners understand the requirements of common questions in future NSC examination papers. For example, if a question requires the drawing or analysis of a well-labelled graph, this must be done to earn the relevant marks e.g. *Paper 1: Explain the multiplier concept with the aid of a well-labelled graph. Paper 2: Explain, with the aid of a well-labelled graph, why the oligopolist will not compete on price to increase his/her market share.* Educators should familiarise their learners with the new phrasing of questions, e.g. the what, why and how type of higher order questions. Learners should be guided by the mark allocation in terms of the depth of the answer. With regard to higher-order questions (especially questions 2.5, 3.5, 4.5 and the additional part of the essay questions), a candidate needs to read the question carefully and highlight the key issue required. Reading the question again would ensure greater accuracy in the candidate's response. Responses need to be formulated and there should be a constant check back to the question to ensure the response logically suits it. It is not wise to respond immediately after the initial reading of the question. Time must be taken to understand the question clearly, e.g. Paper 1: most candidates explained the role of the participants instead of *discussing the role of the various markets in the circular flow.* In Paper 2, most learners explained causes of demand pull and cost push inflation, instead of *only demand pull inflation.*

(d) **Comments and explanations:** Teachers equip learners with the relevant skills needed to express themselves clearly where comments or explanations are required. Learners need guidance on how to express the opinions that are relevant to the context. Refer to *Examination Guidelines* where typical higher order questions are provided. For example:

- Paper 1: **Discuss in detail** the main **objectives** of the public sector in the economy **OR Discuss in detail** the features underpinning forecasting of business cycles.

- Paper 2: Examine in detail how cost and revenue curves can be used to illustrate and explain the dynamics (working) of markets **OR** In your opinion is the competition policy in South Africa destroying or saving businesses?

(e) **The importance of formative testing:** Teachers should build the confidence of learners through the use of short informal formative tests and tasks. Small formative assessment tasks should be used to ascertain whether candidates are able to apply their knowledge, placing emphasis on their own opinion and understanding. This would force learners to take ownership of the learning process (see *Examination Guidelines*: Make use of a diagram and discuss the cycle length, amplitude and the trend line as features underpinning forecasting*).*

(f) The structure of the paper

- **SECTION A:** This section should be explained to learners to enable them to organise their answers properly. Leaving lines open between sub-sections, using the correct numbering system, and not omitting question numbers are examples of issues that make assessment more effective.

- **SECTION C (Essay):** Teachers must stress the importance of the layout of the essay: introduction, body (main and additional part) and conclusion. There should be a clear distinction between the various aspects with line spacing between them. The use of sub-headings is crucial as this earns marks. Learners should make reference to the structure of the essay, which is clearly outlined in the question paper.

- Learners must be made aware that no marks will be earned if any part of the question is repeated in the introduction. The conclusion must not include any point mentioned in the body but can include the learner's own opinion, an alternative viewpoint, any fact to support the body or a summary of the discussion.

- Teachers must make provision for learners to practise the answering of essay questions. When a topic or chapter is finished, an essay question should be given as a test or homework. If given as homework, the essay can be assessed in terms of the following important aspects (detailed assessment is not necessary):

    1. Relevant Introduction
    2. Sub-headings in the main part
    3. The appropriateness of the additional part.
    4. Relevant conclusion.

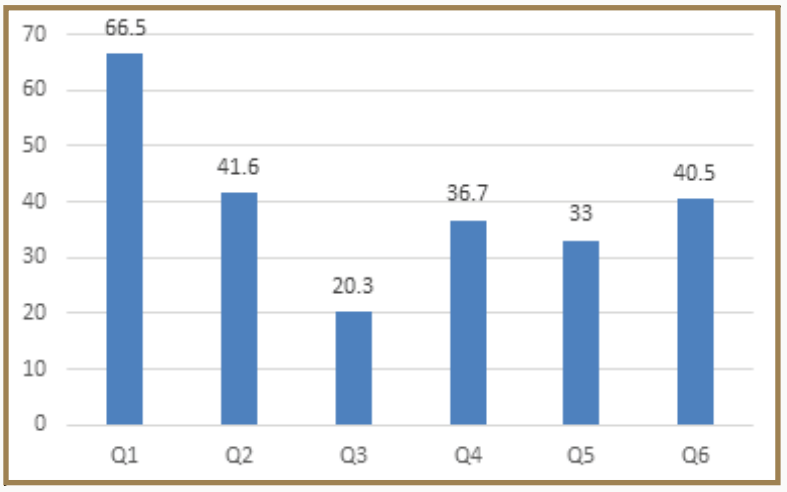
(g) **LTSM:** Teachers are advised to use a variety of textbooks to prepare notes that supplement material available to learners.

5.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

The following graph was based on data from a random sample of candidates. Whil**e this graph might not accurately reflect n**ational averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

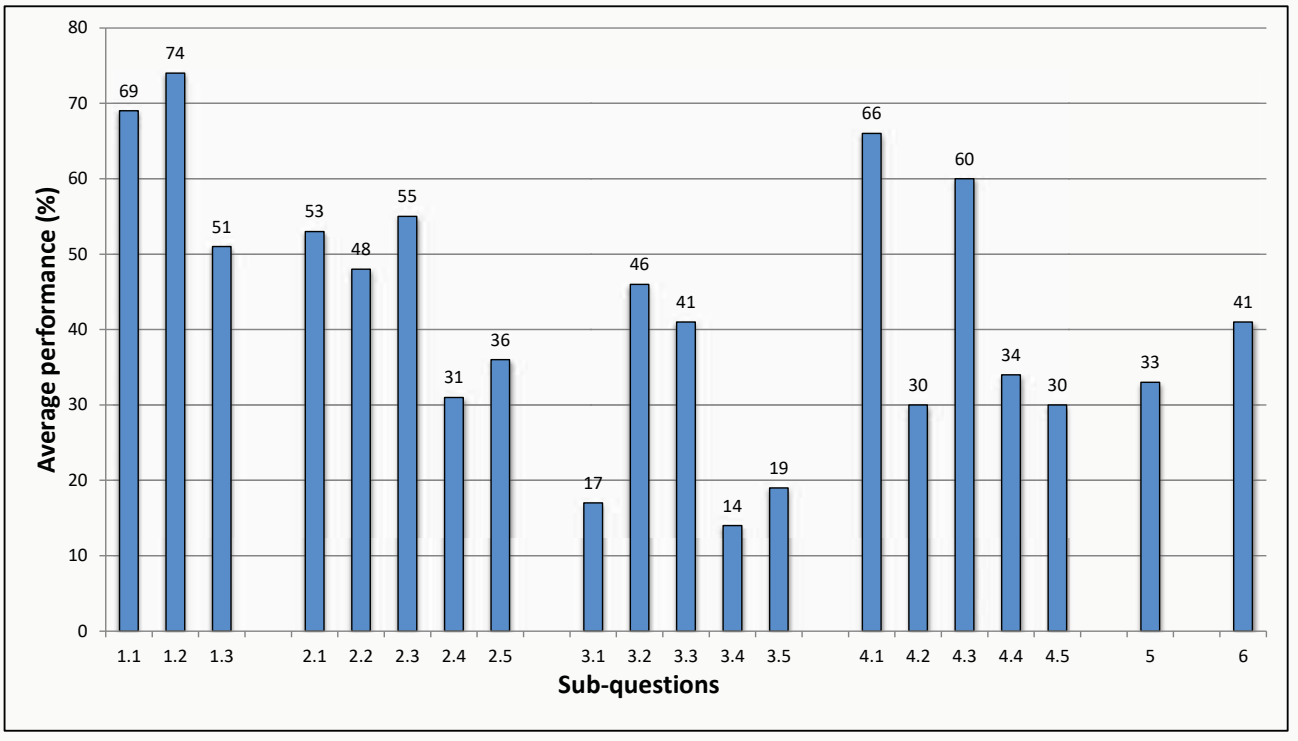
When comparing this year's analysis to 2015's performance, an improvement from 63% to 66.5% in Section A was noted. In Section B, question 3 and question 4 showed a decline in performance. Furthermore, there was an improvement in Question 6 . The average from a sample of scripts was 40,5%, compared to 25% in 2015. However, candidates performed poorly in Question 5. The average from a sample of 900 scripts was 33%, compared to last year's average of 47%. This question was chosen by most candidates.

Figure 5.3.1: Average marks per question expressed as a percentage



Q1	Macroeconomics & economic pursuits
Q2	Macroeconomics
Q3	Economic pursuits
Q4	Macroeconomics & economic pursuits
Q5	Macroeconomics
Q6	Economic pursuits

Figure 5.3.2: Average marks per sub-question expressed as a percentage



5.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

QUESTION 1: MACROECONOMICS & ECONOMIC PURSUITS

Most candidates performed well in Question 1. The performance of learners ranged from excellent to poor. Some candidates attained full marks and others did not even attempt to answer some of the questions. The question was compulsory.

Common errors and misconceptions

(a) The multiple-choice questions in Q1.1 were answered fairly well. The provided answer sheet was a challenge because it could only be used for question 1.1.In Q1.2, candidates had to match an Economics term with given statements. Overall, candidates performed well in this sub-section. In some cases they left out certain answers by mistake or changed their original answers without cancelling the first one. Generally, a lack of content knowledge impaired candidates' performance.

(b) In Q1.3, candidates had to give an Economics term for a given statement. Overall, the performance was very poor and the memorandum accepted only the correct answer - no abbreviations or examples. In Q1.3.2, candidates did not know the difference between the length and amplitude of a business cycle. Basic knowledge of subject terminology remains very important and was the main determinant of the overall quality of a candidate's performance. For example, in Q1.3.4, where candidates could not identify the concept in question and gave an abbreviation instead.

Suggestions for improvement

(a) Question 1 assesses both *Macroeconomics* and *Economic Pursuits.* Candidates' performance in this question gives a clear indication of their subject knowledge. It is imperative that learners first attempt to determine the correct answer to multiple choice questions before considering the given options. Furthermore, the format of Section A should be explained to learners to enable them to organise their answers correctly. In the light of this, candidates need to follow instructions like leaving lines open between sub-sections, using the correct numbering system, and not omitting question numbers. This would facilitate the marking of scripts. The confidence of learners should be built by spending more time on the understanding of economic terminology, definitions and concepts so as to ensure expanded knowledge over the broad spectrum of the subject.

(b) The general improvement in the performance of learners in this section serves as a very strong indication that substantial attempts have been made to expose learners to basic economic concepts. Candidates should answer all questions, especially Question 1.1 and Question 1.2, where the given options are provided. Learners should also concentrate on more detailed preparation regarding concepts and terminology to ensure that they attain higher marks for Q1.3.

(c) Although multiple-choice questions provide possible answers, they require full content knowledge. Q1.3.3 and Q1.3.4 are good examples thereof, because typical answers from candidates reflected a broad knowledge of the subject matter, and not in-depth knowledge. Candidates gave abbreviations and examples, instead of concepts and they were subsequently awarded no marks. Constant revision of terminology is strongly advised.

(d) Difficult topics should be the centre point of discussion e.g. *features underpinning business cycles* and the *different acts*.

QUESTION 2: MACROECONOMICS

Learners' performance ranged from very poor to excellent.

Common errors and misconceptions

(a) A few candidates could not give two types of business cycles in Q2.1.1 and wrote real business cycles instead of the types of business cycles. In Q2.1.2, candidates lacked higher-order thinking skills that are required to answer this question. Candidates confused direct investment with portfolio investment.

(b) Some candidates could not correctly identify types of indirect taxes from the given cartoon and the fiscal instrument represented by the scale in the cartoon. Some found it difficult to discern the 'surprise' by the finance minister in the cartoon.

(c) Candidates failed to depict the trade initiative mentioned in the extract (AGOA). In Q2.3.3 'dumping' could not be described. Although Q2.3.5 was based on the local industry, some candidates' responses included foreign industries and the unemployed.

(d) Candidates found it challenging to explain the two approaches of business cycles. Most candidates were awarded with a maximum of three marks for the basic definition and one example. Many candidates confused the two concepts.

(e) Candidates performed poorly in Q2.5, because they discussed export promotion or defined import substitution, instead of using the methods of import substitution to reduce the deficit on the balance of trade.

Suggestions for improvement

(a) It is of utmost importance that learners be prepared on the whole syllabus and not only parts thereof. Knowledge of the latest statistical data made available by Stats SA and SARB should always be studied in detail to ensure that learners know exactly how to prepare themselves thoroughly for the final examination. Candidates should be able to make use of the provided information to answer questions appropriately.

(b) There is a clear shift towards the candidate's own opinion, interpretation and problem-solving skills as part of data response questions (2.1.2, 2.2.4, 2.3.4 and 2.3.5). A variety of cartoons, extracts from newspapers and magazines and graphs/tables should be discussed in class. Learners should be exposed to current economic issues and they should be guided in their answers.

(c) Learners should be exposed to advanced paragraph-type questions and guided as to how to express their opinion and to support their responses if required to do so. Full exposure to the syllabus is needed.

(d) Candidates should read questions carefully to determine what is expected from them (refer to Q2.3.4).

(e) It was encouraging to note that most candidates attempted all questions. This indicates a definite increase in the level of understanding of those sitting the exam.

QUESTION 3: ECONOMIC PURSUITS

Performance ranged from mediocre to poor. Although the question was fair, only a few candidates attempted it. The performance of candidates was impaired by the more indirect way of questioning, demanding that candidates use advanced thinking skills.

Common errors and misconceptions

(a) Many candidates misinterpreted the cartoons and data-response questions. Most questions demanded thorough reading and interpretation. Candidates found opinion-based questions challenging. They could not name the social indicators related to income distribution (Q3.1.1).

(b) Weaker candidates could not interpret the cartoon in Q3.2 correctly and in Q3.2.5, many failed to explain how labour market access could drive future improvement in living standards.

(c) Candidates could not associate content learnt and its contextualisation – this indicated a lack of general knowledge and interpretation skills.

(d) It could be assumed that current economic issues are not discussed in many classes. Candidates' responses were too generic and lacked factual knowledge in Q3.4. Candidates could not briefly discuss growth and trade as globalisation challenges that face developing countries (countries in the South).

(e) Candidates were unable to describe topics in sufficient detail to earn marks and gave generic information with no relevance to the compliancy of South Africa with various international bodies that require them to standardise their indicators (Q3.5).

(f) It is clear from the most candidates' responses that they are used to pure recall of facts, but lack answering the *how* or the *why* part of each question (see questions 3.1.2, 3.2.3, 3.2.4, 3.3.3, 3.3.4, 3.3.5 and 3.5).

(g) Language still seems to be a barrier and candidates lose marks owing to having a poor command of the language and not explaining concepts fully. Many responses are mainly generic and absolutely void of Economics.

Suggestions for improvement

(a) The main problem seems to be the lack of applying factual knowledge in solving typical day-to-day problems experienced in economies worldwide. The reason might be an insufficient variety of forms of classroom assessment.

(b) Formative tests should be used to ensure that learners are able to understand and define what is meant by: social indicators, deregulation and strategies to improve economic growth, the NDP, globalization and international bodies that standardise indicators.

(c) Additional learning material should be given to learners during the academic year. Data provided in data-response questions should be read thoroughly before candidates attempt to answer any questions. A general complaint is that candidates do not know whether the answer appears in the extract or whether they should give their own opinions. If candidates studied the extract or the cartoon in Q3.2, they would have been able to find possible answers to questions 3.2.1, 3.3.1 and 3.3.2.

(d) More case study questions should be discussed in class and given as homework activities. Debates and presentations of certain topics should be conducted regularly. Teachers ought to include the w*hy, which, how, when, whom* types of questions to teach learners to think beyond typical textbook knowledge.

QUESTION 4: MACROECONOMICS AND ECONOMIC PURSUITS

The general performance of learners in this question ranged from excellent to poor. Most candidates performed well in Q4.1, which was the most popular question.

Common errors and misconceptions

(a) Many candidates could not give the reasons for public sector failure and instead listed typical problems of public sector provisioning. It remained a challenge for candidates to interpret the given figures in questions 4.2.2, 4.2.4 and 4.2.5). This part of the question was poorly answered.

(b) Most candidates could not answer the data base questions 4.3.3 and 4.3.4 correctly. Interpretation of data seems to be a major stumbling block to learners. Learners lack insight into current economic affairs and questions on issues concerning everyday life.

(c) The responses to Q4.4 were impaired mainly because candidates showed a general lack of content knowledge on the arguments in favour of privatisation.

(d) In Q4.5, most candidates included only a description or advantages of subsidies, but ignored *how* subsidies would influence export-orientated businesses negatively. They did not answer the 'how' part, but only listed some facts, irrespective of relevance.

Suggestions for improvement

(a) Learners need to be prepared to answer higher order.

(b) Teachers should use a variety of resource material to prepare learners adequately for the examination. Current economic issues should be used as examples to illustrate the subject in context. Economics in the classroom should be linked to Economics in real life by exposing learners to actual data, graphs and statistics. Educators should ensure that learners know what is expected of them when command verbs (e.g. argue, analyse, differentiate) are part of a question. Learners lack insight into current economic affairs and should be guided to answer questions on issues concerning everyday life.

(c) A detailed study of *Foreign Exchange Market* is strongly advised. The focus should be on components, calculations and the conversion of figures, as well as a detailed interpretation of graphs. Candidates need to understand the demand curve, the supply curve, the Lorenz curve, the Phillips curve and the Laffer curve.

(d) Learners should be prepared to select questions from both Section B and Section C. It happens too often that all of the questions in Section B are answered. Instructions need to be explained to learners.

QUESTION 5: MACROECONOMICS

The general performance of learners in this question ranged from extremely poor to excellent. Although the question was attempted by the majority of candidates, they did not address it adequately in their responses. Most candidates focused on the interaction of participants, instead of discussing the role of the various markets in the circular flow. Learners found the additional 10-mark section too difficult, where the multiplier concept was asked with the aid of a well-labelled graph – this required higher-order thinking.

Common errors and misconceptions

Most candidates could provide only two headings (factor and goods market) and failed to discuss each of the relevant markets (factor, goods, financial, money, capital, foreign exchange markets) in sufficient detail to earn full marks. The additional part of the essay, where candidates had to explain the multiplier concept with the aid of a well labelled graph, was not dealt with in sufficient detail. Many candidates drew the circular flow or a supply and demand curve (dealt with in Paper 2).

Suggestions for improvement

(a) Teachers should encourage learners to read questions carefully before they respond in writing.

(b) Teachers should expose learners to numerous question papers to enable wider awareness of different question types. Learners should be exposed to questions on all levels of difficulty during class activities, tests and internal examinations.

(c) Over and above literal reading of texts, learners need to be guided to read between the lines, infer and evaluate texts, and use their own words to express their views.

(d) Content coverage is of the utmost importance. It seems as if certain parts of the syllabus are left out or regarded as inferior by teachers in the preparation of their learners for the final exam paper.

QUESTION 6: ECONOMIC PURSUITS

The general performance of learners in this question ranged from very poor to excellent. Most candidates did not choose this question.

Common errors and misconceptions

(a) Some candidates focused on one of the initiatives only or discussed initiatives and zones broadly.

(b) The additional part, which demanded higher cognitive thinking skills, was ignored by most candidates.

(c) Learners crunched certain questions and included answers that were not relevant at all.

(d) Many candidates lifted verbatim from the introductory statement of the question.

Suggestions for improvement

(a) Learners should be guided to analyse the requirements of each question. This would ensure that they do not omit any crucial aspect of the answer. Focus should be on areas that can cause confusion.

(b) Basic content should not only be covered but also linked to the creativity of learners in the practical implementation of each topic. Case studies and class discussions can be used gainfully in this regard. Candidates need to improve their evaluation skills. Knowledge about recent developments can assist in making the module more interesting.

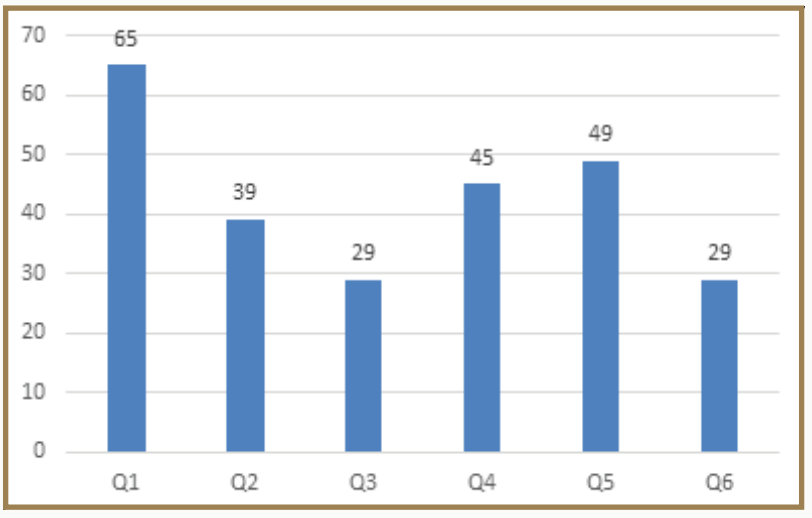
(c) Formative tests should be used to ensure that learners are able to understand and discuss all relevant topics. The whole syllabus should be finished well in advance to ensure enough time for revision. Learners should keep abreast of current news pertinent to aspects of Economics and discuss these regularly in class.

5.5. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

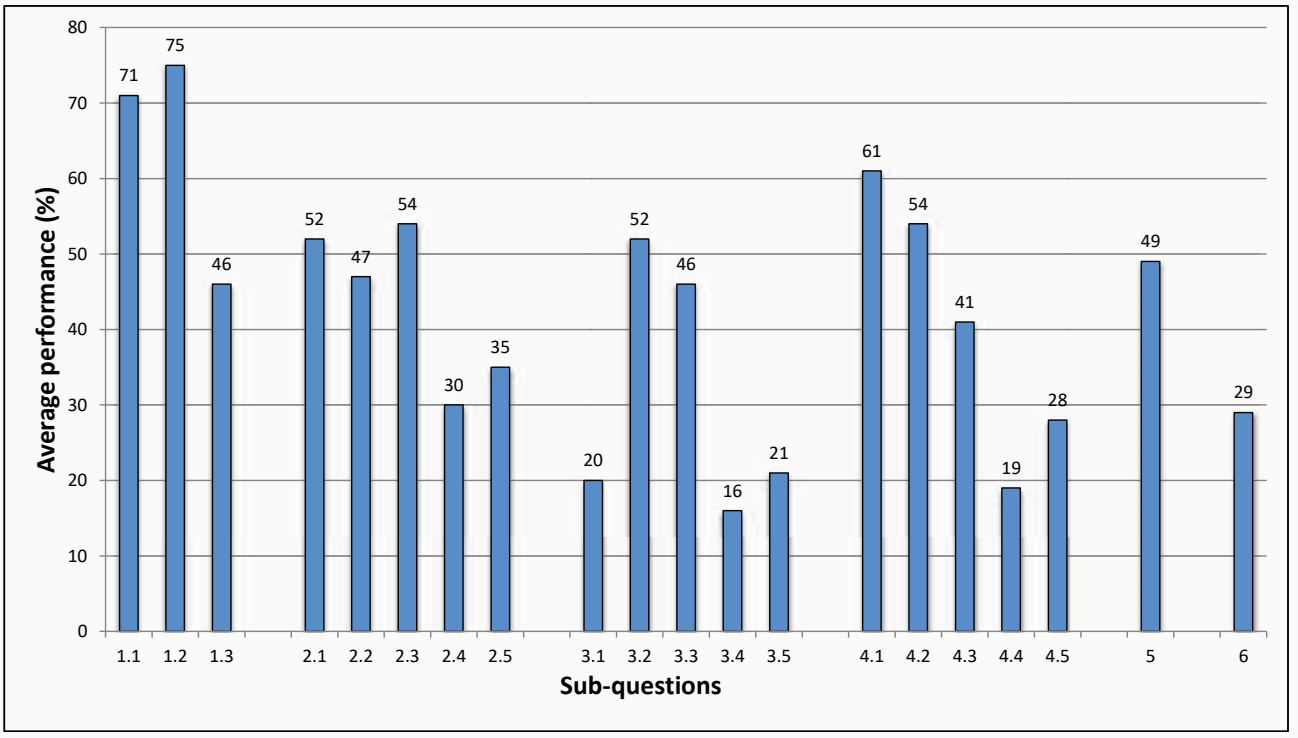
When comparing this year's analysis to 2015 performance, a slight improvement in Section A was noted. In Section B, there was a slight improvement in question 2 but question 3 showed a decline in performance. In Section C, there was a substantial decrease in the performance in question 6, which was based on Contemporary Economic Issues.

Figure 5.5.1:Average marks per question expressed as a percentage



Q1	Micro-economics & Contemporary economic issues
Q2	Micro-economics
Q3	Contemporary economic issues
Q4	Micro-economics & Contemporary economic issues
Q5	Micro-economics
Q6	Contemporary economic issues

Figure 5.5.2: Average marks per sub-question expressed as a percentage



5.6. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

QUESTION 1: MICRO ECONOMICS & CONTEMPORARY ECONOMIC ISSUES

Common errors and misconceptions

The performance of candidates ranged from excellent to very poor. The average mark was **65%**. Many candidates were able to pass paper this due to their performance in question 1. Compared to last year's performance, the general indication is that most candidates performed better in Question 1 in 2016.

(a) In Q1.1, the multiple choice questions were answered fairly well. Certain candidates omitted answers and this then resulted in incorrect numbering. Q1.1.5 was poorly answered with regard to the concept 'implicit GDP deflator' and its relationship to current prices and constant prices.

(b) In Q1.2, most candidates performed fairly well. Learners lost marks due to illegible writing. General lack of content knowledge impacted negatively on performance.

(c) In Q1.3, candidates had to identify an economic term from a given statement. Overall, the performance was fair and there was an improvement from previous years. It is imperative that candidates have a solid grasp of subject terminology. In Q1.3.2, many candidates confused 'the short run' with 'the long run'. In Q1.3.4, many candidates referred to the concept 'copyright', instead of patent. A patent refers to an invention or certain types of discoveries (e.g. mathematical equations and product formulae) associated with manufacturing whereas a copyright is the protection intellectual property rights, e.g. books, plays, music, software, artwork, architectural drawings and maps. In Q1.3.5, many candidates confused the concept greenhouse gasses with green gasses.

Suggestions for improvement

(a) In Q1.1, candidates should write down only the letter (A, B or C) of their choice next to the question number. If they prefer to write the answer out in full, they should not omit any part of the response. It is imperative that learners first attempt to determine the correct answer to multiple choice questions before considering the given options. Candidates must be made aware that that no marks will be awarded when they provide more than one answer to a short question. It is important that candidates cancel an incorrect answer in Q1.1 and Q1.2 and write the correct one next to it, instead of writing over the incorrect answer.

(b) Revision by means of short, regular formative tests on basic concepts is advised. Learners should be encouraged to make a list of the key concepts of each topic.

(c) Definitions and concepts should be emphasized. The use of glossary should form the basis of teaching and learning in Economics.

QUESTION 2: MICRO-ECONOMICS

The performance in this question ranged from very poor to good and was popular with most candidates. Interpreting the graphs and extracts still poses a challenge to learners. There is evidence that candidates are unable to interpret graphs and link content to the data given.

Common errors and misconceptions

(a) Q2.1.1 was fairly well answered. Some listed any public sector institution instead of the institutions regulating competition.

(b) Q2.1.2 was a higher order question and candidates found it quite challenging. Candidates misinterpreted **'minimum** prices'. They described minimum as **low**, as a result their responses were on how people benefit from cheaper prices. This concept and '**maximum** prices' must be understood in relation to the market price.

(c) Q2.2.1 and Q2.2.2 were fairly well answered. In Q2.2.3, many candidates gave 'normal profit' as the answer, instead of explaining how normal profit will be achieved. Q2.2.4 was poorly answered. Most candidates could not determine the conditions for a firm to shut down. It is important that learners relate AR to AVC in determining shutdown point. Many learners indicated shutdown point as MC = AVC, which is technically incorrect as the firms will not shutdown if the price/AR is more than the AVC. In Q2.2.5, responses to calculations have improved. Some provided partial responses, e.g. unit loss instead of total economic loss.

(d) Q2.3 was fairly well answered. There were some candidates who could not identify an external cost from the data given, which demonstrates a lack of conceptual understanding. In Q2.3.5, certain candidates merely listed the steps of CBA without responding to the question.

(e) Q2.4 was poorly answered. Most candidates confused the concepts 'productive inefficiency' and 'allocative inefficiency'. Some answers related to efficiencies instead of inefficiencies.

(f) Most candidates did not perform well in Q2.5, a typical higher order question. Most responded to the question by discussing the methods of non-price competition. Although learners understood the term 'differentiated products', they could not determine how product differentiation influences consumers and producers.

Suggestions for improvement

(a) Learners need to be aware of the specific requirements of a higher order question. In addition, educators need to assess higher order questions appropriately, so that learners clearly understand the mark allocation.

(b) Teachers need to focus on the application of knowledge in their assessment of tasks. Learners can not merely recall information. They need to be apply critical thinking skills.

(c) Teachers should focus on the content and graphs in micro-economics in order to differentiate clearly between the various equilibrium positions. The mastering of drawing graphs is key to understanding the different equilibrium positions in the perfect market. This applies to all other graphs in Microeconomics. Educators must emphasise how equilibrium position changes from the 'short run' (economic profit and economic loss) to the 'long run' (Normal profit). In their responses, learners need to make reference to the influence of the market supply and demand curves on equilibrium market price.

(d) There is evidence that teachers shy away from the teaching of graphs. Regular practice and tests on the drawing of graphs is essential in understanding the content of the topic.

(e) Learners need to practise the drawing of graphs. Class and homework exercises could assist in this regard. In addition, a spot test (formal/informal) on the drawing of graphs could be conducted to improve the understanding of graphs.

QUESTION 3: CONTEMPORARY ECONOMIC ISSUES

This question was the least popular question. The performance in this question was generally poor. Some lower order questions and basic concepts, like conservation and preservation, were poorly answered. The impression created is that these topics are not covered thoroughly or some topics are not taught at all.

Common errors and misconceptions

(a) Q3.1.1 was poorly answered. Candidates listed International agreements instead of Millennium Development Goals. In Q3.1.2, candidates read the question as 'How many', instead of 'How may'. As a result, candidates responded by giving figures. This is a difficult lower order question and requires application of content within a specific context.

(b) In Q3.2.1 some candidates could not identify the answer from a given extract. A whole paragraph was written rather than giving a single word. Identifying the percentage wage increase was in the extract but some candidates answered incorrectly, which is indicative of poor reading and comprehension skill. Generally, Q3.2.1 – Q3.2.4 were fairly well answered. In Q3.2.3 and 3.2.4, some candidates lifted sentences directly from the extract as answers – which showed a lack of understanding of the question.

(c) Question 3.3 was fairly well answered. In Q3.3.1, a mark was not awarded when candidates attempted to write the answer in their own words but gave an incomplete response. Candidates should have quoted from the extract.

(d) Candidates could not differentiate clearly between 'conservation' and 'preservation', in Topic 14: Environmental sustainability.

(e) Most learners failed to respond correctly to Q3.5. They lack higher order thinking skills and the ability to apply the content. Candidates listed negative externalities associated with tourism, instead of explaining how the impact of these externalities could be overcome.

Suggestions for improvement

(a) The teaching of contemporary economic issues is imperative and basic concepts need to be emphasised. These concepts are neglected at times by educators. It is advisable that the syllabus is completed as early as August so that there can be enough time for revision.

(b) Topics like inflation, tourism and environmental sustainability relate to newspaper articles and statistics. Educators are encouraged to make reference to this data when teaching the topics. Data response questions should not merely require learners to copy answers from the given data. Learners should be able to apply content in context.

QUESTION 4: MICRO-ECONOMICS / CONTEMPORARY ECONOMIC ISSUES

Most candidates answered this question. The performance in this question was fair to good. There were challenges in certain sub-sections of the question, especially data response questions and short paragraph questions.

Common errors and misconceptions

(a) Q4.1.1 and Q4.1.2 were generally well answered.

(b) Q4.2.3 was poorly answered. The majority of candidates could not provide a reason why the MR curve lies below the demand curve. They failed to relate their responses to the negative sloping demand curve, where more goods are purchased at a lower price. Hence, Marginal revenue will decrease and will be lower than the price. Thus the MR curve will always be below the demand curve. In Q4.2.4 many candidates confused the monopolist with monopolistic competition.

(c) Q4.2.5 was poorly answered. Most candidates were not able to complete the graph as requested. The drawing of graphs and interpretation still poses a major challenge to most candidates and it seems as if basics are not taught properly.

(d) Q4.3 was answered fairly well by most candidates.

(e) Q4.4 was poorly answered. Many candidates referred to the advantages of competition instead of the goals of the competition policy.

(f) Q4.5 was poor to fairly-well answered. The majority of candidates used examples to explain how consumers failed to protect the environment. Many candidates misinterpreted the question. They explained business actions instead of consumer actions.

Suggestions for improvement

(a) Educators must emphasise the essential difference between perfect markets and monopolies in terms of the demand curve and marginal revenue curve.

(b) The whole syllabus should be taught. It is clear from the responses of candidates that the more difficult topics are not taught and assessed properly. Therefore, candidates regard these topics as unimportant (e.g. the CBA, market failure, environmental sustainability, graphs.)

(c) Educators must continuously test graph illustration and interpretation via data response questions in order to improve understanding and performance of these challenging aspects of Micro-economics.

QUESTION 5: MICRO-ECONOMICS

General performance in the question ranged from poor to excellent. The majority of candidates managed to do better in the main part of the question than in the additional part. Learners were not able to explain the characteristics of the oligopoly. They only listed the characteristics of the oligopoly, sometimes in a tabular form. Poor sentence construction was evident in responses.

Common errors and misconceptions

(a) Candidates were able to give a good introduction to the question. Some candidates only wrote the lead statement to the question as part of the introduction. No credit was awarded to those candidates.

(b) **Main Part:** This was answered fairly well by most candidates. Most essays lacked structure in terms of subheadings, but there seemed to be an improvement from 2015. Characteristics were merely listed instead of explained. Examples of oligopoly were confused with that of monopolistic competition.

(c) **Additional part:** This part proved to be challenging to candidates in terms of completion of answer. Most the candidates attempted to draw and explain the kinked demand curve without answering the **question**. They failed to use the graph to explain why oligopolists will not compete on prices. If the oligopoly increases or decreases his price, the answer should relate to a decrease in revenue. Instead they just drew the kinked demand curve.

Conclusion: Although guided in the question paper as to what a conclusion should entail, the writing of a relevant conclusion is challenge for most candidates. Most candidates could not give conclusions that reflected an opinion, a summary of the discussion or an alternative viewpoint to support the body. Most candidates repeated aspects of the body in the conclusion.

Suggestions for improvement

(a) Educators must test learners regularly on essay question by focusing more on the structure.

(b) Subject Advisers/Cluster leaders must provide adequate support and material that would help them to deal with challenging topics, e.g. graphs.

(c) Teachers must ensure that learners are able to interpret questions correctly so as to avoid irrelevant information in their responses. Teachers are encouraged to expose learners to different questions on the same topic and guide them on the interpretation of questions. In this regard, learners should practice how to structure responses to questions based on key issues.

QUESTION 6: CONTEMPORARY ECONOMIC ISSUES

In general, the level of performance in response to the question was poor. Most candidates managed to do better in the main part of the question than in the additional part**.** Learners who misinterpreted the question, focused on other aspects of inflation, instead of only addressing the causes of demand pull inflation. The additional part proved to be very challenging to most learners.

Common errors and misconceptions

(a) Most candidates were able to give a good introduction to their answers.

Some candidates wrote the lead statement to the question as part of the introduction.

(b) Main Part:

- The majority of candidates explained causes of both demand-pull and cost push inflation. Some explained the characteristics of demand-pull inflation.
- Many candidates did not use sub-headings to structure their work, losing marks in the process.
- Those that used headings failed to link the explanation to the cause of demand pull inflation.
- Repetition of facts occurred regularly.

(c) Additional Part: This section was poorly answered by most candidates.

A solid interpretation of the question was a major challenge for most as they merely listed monetary policy instruments. They were not able to address how successful these instruments were in combating demand pull inflation.

(d) Conclusion: Most candidates could not come up with appropriate responses that reflected an opinion / a summary of the discussion or an alternative or additional viewpoint to support the body of the essay. Many candidates repeated aspects of the body.

Suggestions for improvement

(a) Conclusion: learners should be taught how to structure a response in support of or against the facts mentioned in the main part.

(b) The whole syllabus should be completed so that there is time for revision. There is a tendency for educators to rush through the last few chapters and not to spend as much time on contemporary economic topics as on other topics. Educators need to plan properly so that each topic is given adequate attention.

(c) Basic content should not only be covered, but also linked to the creativity of learners in the practical application of each topic.

CHAPTER 6: ENGLISH FIRST ADDITIONAL LANGUAGE

The following report should be read in conjunction with the English First Additional Language question papers of the November 2016 Examination.

6.1. PERFORMANCE TRENDS: PAPERS 1 – 3 (2013 – 2016)

The general performance of candidates reflects an improvement compared to that of 2015.

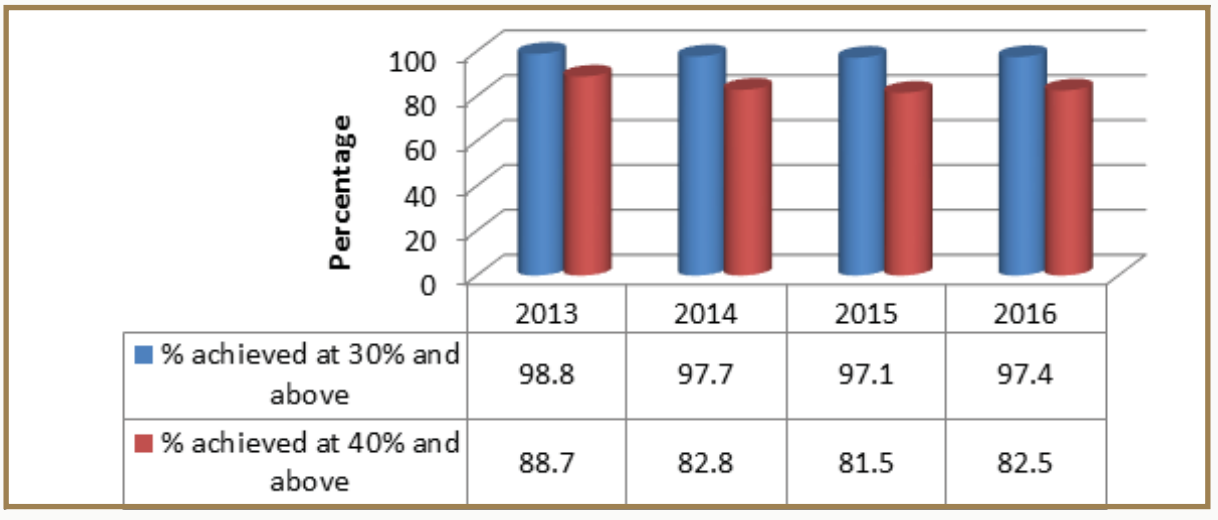
In 2016, the following features are noted:

- The number of candidates writing the subject increased by 3 482.
- The general achievement of candidates improved this year, as indicated by 97, 4% of candidates achieving at 30% and above, with 82, 5% achieving at 40% and above.

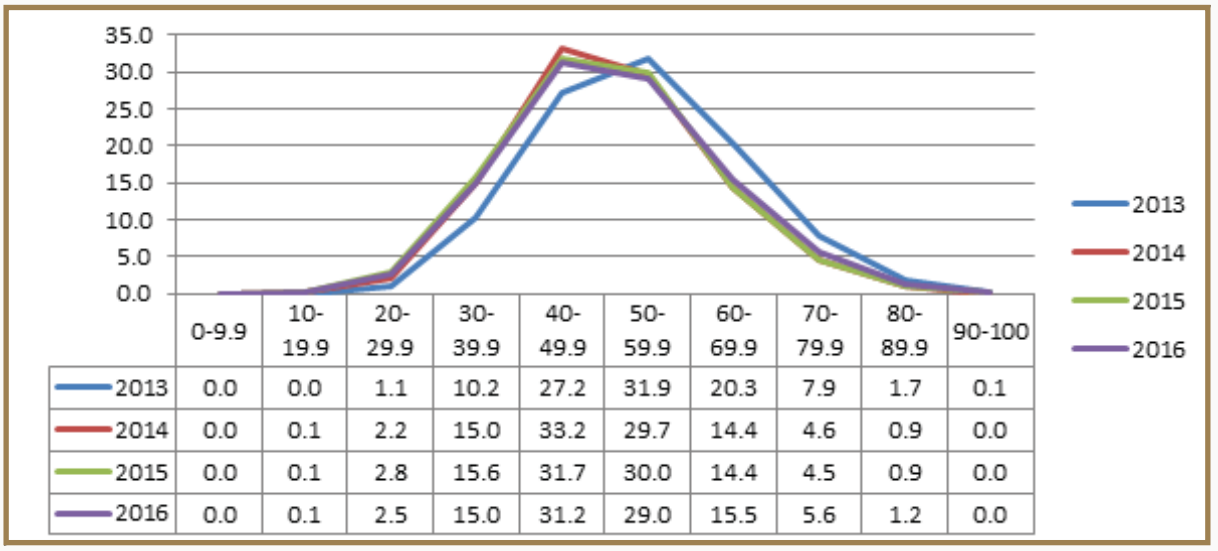
Table 6.1.1: Overall achievement rates in English First Additional Language

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	454666	449 420	98,8	403 081	88,7
2014	432933	423 134	97,7	358 373	82,8
2015	543941	528 157	97,1	443 083	81,5
2016	547 292	533 235	97,4	451 376	82,5

Graph 6.1.1: Overall achievement rates in English First Additional Language



Graph 6.1.2: Performance distribution curves (English First Additional Language: 2013–2016)



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.0	0.0	1.1	10.2	27.2	31.9	20.3	7.9	1.7	0.1
2014	0.0	0.1	2.2	15.0	33.2	29.7	14.4	4.6	0.9	0.0
2015	0.0	0.1	2.8	15.6	31.7	30.0	14.4	4.5	0.9	0.0
2016	0.0	0.1	2.5	15.0	31.2	29.0	15.5	5.6	1.2	0.0

From the above graphs, it is clear that after the decline in 2014 and 2015, there has been an improvement in the performance of candidates in 2016.

6.2. OVERVIEW OF LEARNER PERFORMANCES IN PAPER 1

General comments

(a) Some comprehension skills appeared to have improved, there still seemed to be many candidates who were unable to grasp the gist of the passage set for comprehension and formulate coherent answers using their own words.

(b) Candidates who did not do well displayed a lack of vocabulary and a clear inability to interpret figurative language.

(c) It seemed that summarising skills are improving slowly but surely. However, candidates often fail to follow the instructions given.

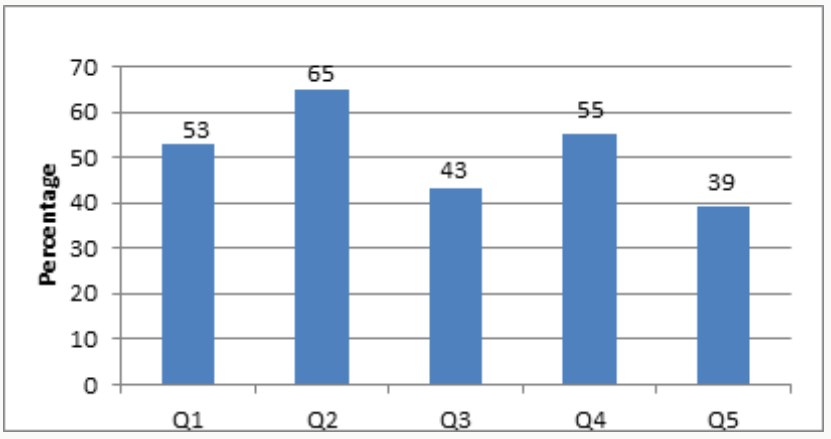
(d) Formal language skills deserve attention. Some basic constructions appeared to not have been mastered by a large number of candidates.

6.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

The following graph was based on data from a random sample of candidates. This graph might not accurately reflect national averages, but it should still be useful in assessing the relative degree of success achieved by candidates.

In this sample, the performance of candidates in Question 5, which tested language and editing skills, continued to decline.This remains the section of this question paper where candidates achieved the lowest marks. Candidates performed best in Question2, the summary.The results for Question 4, the cartoon question, showed an improvement compared to 2015.

Figure 6.3.1: Average marks per question expressed as a percentage in Paper 1



Q1	Comprehension
Q2	Summary
Q3	Analysing an advertisement
Q4	Analysing a cartoon
Q5	Language and editing skills

6.4. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 1

QUESTION 1: COMPREHENSION TEST

Common errors and misconceptions

(a) Candidates did not fully comprehend Q1.2. They failed to identify the two organisations that worked together in the survey, and, instead, offered the name of the company whichhad done the survey as one of their answers. This is an indication that they merely glanced perfunctorily at the passage and wrote down the first two names that came up, neglecting to interact with the text fully and ensure comprehension. It was clear that many candidates did not read the questions with focused attention, as was also shown by the wrong responses given in a relatively simple question like Q1.6.

(b) Many candidates still ignored instructions given. Despite the very clear instruction to quote a SINGLE word in Q1.3, many candidates quoted more than one word and lost a mark.

(c) A disconcerting number of candidates demonstrated a lack of vocabulary when responding to Q1.4, by not understanding what 'leading fast food outlets' were.In addition, the candidates who lost these marks did not use the passage (context) to infer the meaning of the phrase. This showed that candidates did not utilise the passage provided to their advantage.

(d) The interpretation of instructionscontaining ‘name’ (Q1.1), ‘explain’ (Q1.4 and Q1.5) and ‘state’ (Q1.6 and Q1.8) still presented problems.Some candidates continued to ‘list’ when they were required to ‘explain’ or ‘discuss’.In addition, candidates failed to read up to the end of every question, losing marks as a result. Examples are Q1.9 and Q1.11, where the crucial instructions to ‘give a reason for your answer’ and ‘substantiate your answer’ were ignored.

(e) Q1.11 asked for the candidate’s view about the effectiveness of the passage. A large number of candidates, guided by the 3-mark allocation, wrote lengthy answers on their views on salt intake in general, whilst not referring to the passage at all. Others quoted at length from the passage, making them equally culpable of not doing what the question required.

(f) Interpreting the meaning of the idiomatic expression in the title of the passage (Q1.12) proved to be quite a challenge. In some cases, candidates managed to show understanding of the idiom, but failed to show how or why this was a suitable title for this passage.

(g) The number of candidates who failed to score both marks in Q1.14 indicated that the skill of showing a difference between two concepts (comparing) was lacking among candidates. Many candidates gave only the information for one of the two days, not showing any difference between them, as was required by the question.

(h) Identifying the message of a text remained a problem. Even candidates who managed to say in Q1.13 what the illustration represented, struggled in Q1.16 to assess whether the visuals accurately conveyed the message of the text. There seemed to be a persistent inability among candidates to analyse visual texts.

Suggestions for improvement

(a) Teachers should use every available opportunity to expose learners to varioustexts to hone their comprehension skills. These should include visual texts, good verbal texts and even audio texts. If learners understand that not only the reading passage but also the questions have to be understood, the quality of their responses should improve.

(b) The importance of adhering to instructions should be instilled in learners. They must be taught to scrutinise questions for key words and instructions like ‘name’, ‘explain’ and ‘state’ to ensure that marks are not lost unnecessarily. Furthermore, learners must be taught to differentiate what each instruction requires of them; for example: name/list as opposed to explain/discuss.

(c) Vocabulary can and should be built actively. Learners should be encouraged and motivated to engage with good texts and, while doing so, to use dictionaries, thesauruses and other learning aids. There is not a single aspect of this question paper which will not benefit from such an exercise.

(d) Teachers who demonstrate and teach how to formulate opinions based on a given text, will be doing their learners a service as they will see a definite improvement in their marks for open-ended and opinion questions.

(e) Interpreting figurative language is closely related to the ability to infer. This should be taught and the best way to do it is to expose learners to a variety of good texts. Only by teaching them to find meaning below the surface of a text (reading between the lines), will teachers empower their learners to perform well in the questions with a higher cognitive demand.

(f) Learners should be offered frequent opportunities to answer questions of the same complexity as those in the final examination. They should be familiar with the skill of analysing and responding to a question requiring more than a simple response, for example, when a difference between two aspects has to be shown.

(g) There is always a possibility that the reading passage in an examination will not be interesting to every candidate, or even that it will contain subject matter with which the candidate is not familiar. It is, therefore, essential that teachers broaden the horizons of their learners by exposing them to various reading material in class, engage in topical discussions and, perhaps most importantly, teach them to utilise the reading passage when responding to the questions. Learners do not necessarily have to have been to a fast food outlet themselves to be able to understand a reading passage on that topic.

QUESTION 2: SUMMARY

General comments

(a) Most candidates seemed to have mastered the format and skills required by the summary question.

(b) Quoting remains a stumbling block for many candidates, causing them to lose marks. A large number of candidates managed to paraphrase, thus showing their understanding and ability to manipulate the language, which is what this question assessed.

Common errors and misconceptions

(a) Some candidates did not adhere to the instruction to summarise the text into a list of facts on *how to save water*. These candidates merely condensed the passage and often ended up with a summary containing only one, or sometimes,none of the relevant facts.

(b) An absence of reading comprehension skill was identified in some very incoherent responses where candidates quoted haphazardly from the given passage.

(c) In some cases candidates wrote miniature essays, offering innovative water-saving tips of their own, not adhering to the instruction to summarise the provided passage.

(d) A number of candidates presented their responses in the same format as that of the marking guideline, including both quotations and paraphrase. This obviously led to the word limit being exceeded and a severe loss of marks.

(e) Some summaries were presented in paragraph form, despite the point-form summaries having been set for many years now, as prescribed by CAPS. Candidates were not penalised for using the wrong format, but writing in paragraph form very often leads to the exceeding of the word limitand the omission of key facts.

Suggestions for improvement

(a) Learners should be afforded numerous opportunities to practise the skill of summarising information so that they can hone this essential skill. The curriculum requires this ability to summarise information from the early grades, and this skill should bewell refined by Grade 12.

(b) Learners should be taught that the summary must be written in full, coherent sentences.

(c) Different ways of turning facts into their own words should be taught– e.g. using active/passive voice,

turning a negative statement into a positive one, the use of synonyms. The format used in the marking guideline can be a useful teaching tool, but learners should be made aware that their final summaries should not contain any quotations.

(d) This summary lent itself very well to the use of the imperative form – teachers should familiarise their learners with this language skill.

(e) Learners should be taughtto master the format of the point-form summary – this is one aspect of the question paper which should not be intimidating at all, as it has been asked in this form since 2000.

QUESTION 3: ANALYSING AND ADVERTISEMENT

Common errors and misconceptions

(a) Despite the fact that questions on the target audience have been asked in the past, the term appeared as though it was new to many candidates. Candidates' responses to Q3.1 included 'cats', 'everyone' and 'humans', which indicates that the concept (target audience) had not been taught thoroughly.

(b) The reference to visual and verbal advertising techniques in Q3.3 was misunderstood by a large number of candidates. Some candidates referred to either visual or verbal techniques, while the responses in many cases suggested that the candidates had no inkling of advertising techniques of any kind.

(c) The word, 'ellipsis' in Q3.4 seemed to be completely unfamiliar to some candidates, as did the term, 'singular' in Q3.5. These linguistic terms, which are clearly listed in the CAPS document as content to be taught, were not well known and cost candidates valuable marks.

(d) The spelling of 'laboratory' presented a problem, even though the only challenge was in changing the '-ies' ending back to '-y'. Candidates could not manage to transcribe the root part of the word correctly. This could be due to a lack of vocabulary, carelessness, lack of technical skill or a combination of these.

(e) Q3.6 was expected to be challenging for candidates. Although, a numberof candidates did make the correct inference, they were unable to transfer their understanding into discussion of the effectiveness of the advertisement in Q3.7. Many candidates discussed the effectiveness of the product instead.

(f) Performance in the advertising question left the impression that candidates were not exposed to many different kinds of advertisements. Despite showing an understanding of the horror film theme in this advertisement (Q3.6 and Q3.7), many candidates were not able to assess the effectiveness of using that technique, thus showing a lack of insight.

Suggestions for improvement

(a) Exercises to hone learners' knowledge of advertising techniques and terminology (e.g. 'target audience'; 'visual and verbal techniques') should be done regularly.

(b) Exposing learners to a variety of advertising materials will enrich their understanding and enjoyment of the genre.

(c) Learners should be taught that not every advertisement promotes a specific product, but that some advertise a manufacturer, an idea or a lifestyle, among other possibilities.Being able to identify the purpose of an advertisement (or, in fact, any text) is an important reading and understanding skill.

(d) Frequent opportunities to interact with a variety of advertising texts will boost learners' self-confidence so that they will be able to evaluate the effectiveness of an advertisement and be less hesitant to voice an opinion in answering more demanding questions like Q3.7.

QUESTION 4: ANALYSING A CARTOON

Common errors and misconceptions

(a) Q4.1.1 was intended to be the simple first question to ease candidates into the cartoon. It turned out to be a stumbling block for many candidates because of a lack of knowledge of prepositions. A large number of candidates did not recognise that the setting of the cartoon was outdoors, which shows that they did not analyse the cartoon carefully.

(b) Once again the deficiency in knowledge of subject terminology prevented candidates from gaining marks in Q4.1.2 as many did not understand the term 'visual clue'.

(c) The context of the cartoon was not used by some candidates when answering Q4.1.3 – many referred to a 'starter' as the first dish on a menu, which was not relevant in this context. It is also possible that these candidates made the well-known mistake of not reading the question up to the end.

(d) The concept of a tag question (Q4.2) appeared to be foreign to some candidates, as did the correct use of the apostrophe.

(e) In addition to experiencing problems with the understanding of 'tone', candidates often contradicted themselves when responding to Q4.5, saying that the calm tone was appropriate because the cartoon character Blondie was angry. Many responses to this question were incoherent.

Suggestions for improvement

(a) The basic features of visual literacy must be taught. Candidatesmust know and be able explain terms like 'visual clue'.

(b) The language section of the question paper starts with Question 3. The observation is that candidates treat the advertisement and cartoon questions as additional comprehension exercises. Finding a very simple construction like a tag question anywhere in the language section of a question paper should not be a surprise. Teachers must teach ALL the basic language structures and conventions as listed on pp 46 – 48 of the CAPS document.

(c) Regular exposure to cartoons is not only an enjoyable way of teaching an abundance of skills, but it is also essential in equipping learners for the visual literacy section of the question paper. There are many visual texts available on the internet, in the press and in textbooks, and learners can also be invited to bring some of their own.

(d) Learners should be taught to re-read the questions and their own answers to ensure they have answered sensibly, and to get rid of any incoherence that might have crept into a response.

(e) The concept of tone should be well-known to a Grade 12 candidate – it should be taught from the lower grades in literature, language and writing lessons. Atmosphere, mood and tone are integral and inter-related aspects of virtually all written texts. Teachers should introduce and explain these to the learners at every available opportunity.

QUESTION 5: LANGUAGE AND EDITING

Even though the candidates for this paper do not have English as their home language, this questionasesses language accuracy, so spelling, punctuation, transcribing accurately, and language skills are essential.

Common errors and misconceptions

(a) Identifying and correcting language errors has become a regular part of Paper 1, but many candidates seem to find it very challenging. This exercise requires reading and language skills, as well as some technical knowledge, but sadly some orall of these seem to be lacking in many candidates.

(b) Q5.1.5 instructed candidates to rewrite the sentence in reported speech, but also embedded in this question were verb skills, the use of pronouns and punctuation. Candidates often lost some of these marks because they were inattentive to some of these aspects.

(c) The fact that some candidates still used quotation marks in their responses to Q5.1.5, shows a severe lack of exposure to exercises on indirect speech and the punctuation thereof.

(d) Responses to Q5.1.6 were sometimes completely meaningless, indicating that candidates did not know what they were dealing with. Many candidates got only the verb form wrong, which still cost them the mark.

(e) Q5.1.7 asked for a homonym. Candidates should not only know what a homonym is, but also understand that a homonym can only be assessed in a sentence. Many candidates could not construct a correct sentence, opting for words they could not spell or difficult constructions, and thus lost the mark.

(f) Unfortunately, many candidates could not respond correctly to Q5.2.1, despite the fact that the figure of speech (pun) had been given to them. This indicated a severe lack of knowledge of this stylistic device.

(g) A lack of technical and working knowledge of tenses caused many candidates to use the future continuous tense instead of the simple future tense in Q5.2.3.

(h) Candidates did not do well in most questions on formal language structures: e.g. Q5.1.2, 5, Q.1.3, Q5.1.4, Q5.1.7, Q5.1.8, Q5.2.2, and Q5.2.6.

Suggestions for improvement

(i) Learners should be exposed to texts with errors to be corrected. This can be done both orally and in writing.

(j) The CAPS document conveniently lists the language structures and conventions which are to be taught – teachers should utilise this and remember that regular practise in applying these skills is essential. Some basic skills might have been taught in an earlier grade, but the learners need to practise regularly to retain the skill.

(k) Teachers must ensure that the jargon of the language paper does not become a stumbling block to the learners. A candidate who does not recognise the terms ‘reported speech’ or ‘homonym/synonym/antonym’ will lose marks even if he/she might unknowingly have mastered the skill to respond to a question on that aspect.

(l) When preparing learners for the final examination, teachers need to plan carefully and include frequent exercises and class tests to monitor the learners’ progress and identify problem areas for remediation.

(m) The ability to construct a simple sentence should not be a point of contention at Grade 12 level. Candidates must practise this skill (constructing a simple sentence) and they should not use words or constructions that they have not mastered well.

(n) Remedial work after tests and examinations, and also after any written work, will yield good feedback to learners and impact positively on their results, not only in this question paper, but also in P2 and P3.

(o) Past question papers are useful revision tools, but they should not become a limiting or prescriptive source. Learners deserve to be given as many opportunities as possible to interact with texts from a broad range of sources.

ENGLISH FIRST ADDITIONAL LANGUAGE P2

6.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

General comments

(a) There were, unfortunately, still some candidates who appeared to have read the prescribed texts very superficially (if at all). These candidates then treated the question paper like a comprehension exercise, offering all their responses based on the given extracts.

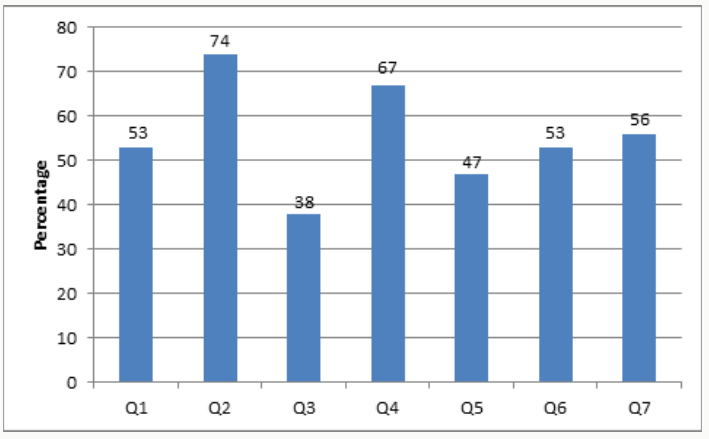
(b) The candidates who performed well had a good knowledge of and insight into the texts and also managed to respond in accordance with the instructions and the mark allocation.

6.6. DIAGNOSTIC QUESTION ANALYSIS OF PAPER 2

The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degree of challenge of each question as experienced by candidates.

Candidates performed least successfully in question 3 (*A Grain of Wheat*). This novel was also the least popular choice. Candidates performed the best in question 2 (*Lord of the Flies)*,but, unfortunately, not many candidates answered this question. The most popular questions were 5, 6 and 7.

Graph 6.6.1: Average marks per question expressed as a percentage in Paper 2



Q1	To Kill a Mockingbird
Q2	Lord of the Flies
Q3	A Grain of Wheat
Q4	Romeo and Juliet
Q5	Nothing but the Truth
Q6	Short Stories
Q7	Poetry

6.7. ANALYSIS OF LEARNER PERFORMANCE IN PAPER 2

Common errors and misconceptions

(a) Executing choices seemed to have been a challenge for many candidates. They started answering questions as they were presented in the question paper, entirely disregarding the instructions, table of contents and checklist provided in the paper.

(b) Where a question required a certain number of responses (e.g. Q1.2.5,Q2.1.2b,Q2.1.4,Q3.1.3, Q3.1.4, Q3.2.1, Q4.2.4, Q4.2.5, Q5.1.2, Q5.1.3,Q5.2.2, Q5.2.4, Q6.1.3, Q6.2.1, Q7.2.1b), candidates wasted time with lengthy answers but could not be credited as only the required number of responses was assessed. This principle is followed across all subjects and is the only valid and fair way to prevent the marker from choosing the best responses on behalf of the candidate.

(c) Every question, across all the genres, included simple questions requiring candidates to recall details from the texts (e.g. Q1.1.1, Q1.1.5, Q2.1.1, Q2.1.2a, Q3.1.1, Q3.2.2, Q4.1.1, Q4.2.2a, Q5.1.1, Q5.1.2b, Q6.1.1, Q6.1.5, Q6.2.1a, Q6.2.2a, Q7.1.1, Q7.1.3, Q7.2.1) The fact that so many candidates experienced difficulty in responding to these questions points to a lack of preparation, a lack of teaching, or a combination of these.

(d) When asked to identify and or discuss the purpose of stylistic devices (e.g. Q1.2.3, Q2.1.3, Q3.2.5, Q4.1.3, Q6.1.6, Q6.2.4a, Q7.1.2, Q7.1.5, Q7.2.3, Q7.2.4), candidates often displayed a lack of knowledge and skills. Some could not identify these devices, and even more could not explain why the devices were used or how they contributed to the text.

(e) The questions on characterisation in this year's question paper required candidates to link a character trait with an example of behaviour (e.g. Q1.2.5, Q2.1.4, Q3.1.4, Q4.2.5, Q5.1.3). Some candidates appeared to be unable to do this.

(f) Questions dealing with theme were once again not answered well (e.g. Q1.2.6, Q2.2.6, Q3.2.6, Q4.1.6, Q5.1.4c, Q6.2.4b). Although the theme of a certain text cannot change, responses from previous marking guidelines cannot simply be regurgitated. All these questions required the candidate to find a theme evident in the specific extract.

(g) The questions on tone (Q1.1.3b, Q4.1.4, Q5.1.4, Q6.2.2b) presented problems. The concept is not simple, but at school-leaving level a candidate should have mastered it.

(h) Candidates disregard instructions too often. In some cases, it appears that they did not read the entire question, but often the problem seemed to be a lack of understanding of the commonly used assessment terms such as 'explain how/why', 'state' and 'discuss'.

(i) Responding to questions which required the candidate to give an opinion (e.g. Q1.1.7, Q2.1.6, Q3.1.6, Q4.1.7, Q5.1.6, Q6.1.7, Q7.2.6) is a skill which requires knowledge and insight which will lead to self-confidence. Candidates had difficulty gaining full marks for these questions as one or more of the mentioned components were lacking.

Suggestions for improvement

(a) The structure of the question paper has not changed recently and will remain unchanged even when the prescribed texts change. Candidates should be taught to choose the rightquestions when they sit for the examination. Teachers should expose their learners to question papers containing questions from texts they have not studied in the mid-year examination and again in the September trial examination.

(b) Teachers must apply the same marking principles from the earlier grades on. Learners must be taught that if they are asked for TWO points, they must choose the two points that are most likely to be credited. The choice can never be left to the marker as that would lead to innumerable unfair practices.

(c) Candidates cannot acquire insight into the texts without having mastered knowledge of the content. Even the short stories and poetry have to be studied in detail and no teacher should expect learners to do this at home without these texts being taught and guidance given to learners. The short stories may be short, but the detail has to be taught and studied – the characters in the short stories are often not very complex, but they are all important.

(d) At Grade 12 level, candidates are expected to do more than merely identify stylistic devices. This is clearly stipulated on pp 31 – 32 of the CAPS document. Teachers must ensure that their learners can not only name such devices, but they have to be able to comment on how these devices enrich the texts.

(e) Characterisation must be taught in context – a character trait cannot be attributed to a character without referring to the behaviour to substantiate it. Teachers should guard against allowing (or even forcing) learners to memorise lists of character traits without the accompanying insight into the behaviour of the characters.

(f) Themes should not merely be memorised without insight. Teachers must show learners how the various themes become evident in different parts of the text, so that the candidates will be able to identify a relevant theme in the given extract, and also gain the skill of isolating events which support a certain theme from a text.

(g) Teachers have to guide learners to discover all the layers of literature, and ensure that by the time they write the final examination they appreciate that literature consists of more components than a plot. Tone is one of the aspects they must be exposed to – if they do not know this, a large part of the enjoyment of the text they are working with, will be lost.

(h) Candidates must be exposed to examination instructions and questions so that they are confident when they are confronted with the question paper and so that the jargon of the examination does not become an obstacle.

(i) Learners should be taught to interpret the texts and teachers should be careful not to stifle the interpretations that may emanate from their learners.If learners are familiar with the different qualities of literary texts, they should be able to form and express opinions based on the texts. Ensuring that they have enough knowledge and insight upon which they can base these opinions, will result in sufficient self-confidence to answer the questions with higher cognitive demands.

ENGLISH FIRST ADDITIONAL LANGUAGE P3

General comments

(a) It is the duty of teachers to stress that this paper carries the most marks and can make a significant difference to the candidates' results. The fact that the paper is written towards the end of the examination may create the misconception that it is not important.

(b) Candidates must be encouraged to prepare well for this paper, as the skills and language structures used in the first two papers can be applied here with great success. In addition, the formal aspects of format should be taught and studied.

(c) The importance of analysing a topic or a set of instructions should be emphasised. Candidates are penalised if they respond only partially to a given topic, and it is often only the result of the candidate's neglect inpaying attention to every aspect of the topic.

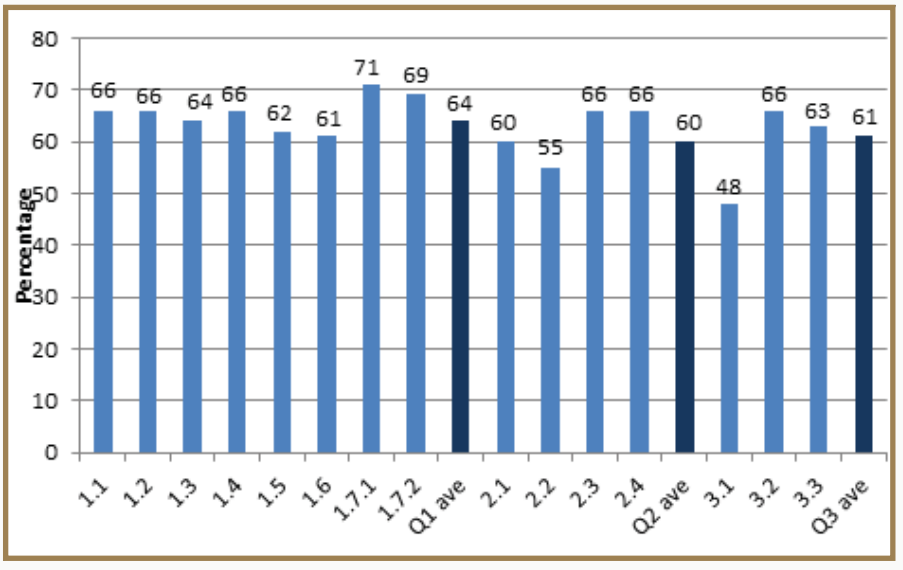
6.8. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 3

The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degree of challenge of each question as experienced by candidates.

Candidates performed the most successfully in Section A, although performance in the three sections did not vary significantly.

6.9. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 3

Graph 6.9.1 Average marks per question expressed as a percentage in Paper 3



1.1	It was just a second ...
1.2	As I sit here...
1.3	Eleanor R quotation
1.4	What a match!
1.5	Education & character
1.6	Family & society
1.7.1	Picture: faces
1.7.2	Picture: Technology
2.1	Friendly letter
2.2	Covering letter
2.3	Magazine article
2.4	Dialogue
3.1	Poster
3.2	Diary
3.3	Instructions

SECTION A: ESSAYS

Common errors and misconceptions

(a) Question 1.1: A common misconception was that some candidates interpreted the 'second' in the topic as a 'second chance' and therefore performed below average, as the idea of 'change' required by the topic did not feature anywhere in the essay. Some candidates also deviated from the idea of 'a second' and described a change that took place over an extended period of time.

(b) Many responses to Q1.4 were unoriginal and were based on soccer or rugby. Writing about sport is not an error, but in a question paper at this level some interpretation or at least clever use of language to create an atmosphere is expected. Candidates who launched into a narrative about a sports match often realised that they were being too long-winded and then contrived a very abrupt ending.

(c) Candidates who responded to Q1.5had largely misinterpreted the topic by not getting to the second part ('if it does not build your character') at all. Numerous candidates merely wrote about education in general, or about their negative impressions of education.

(d) When responding to Q1.6, many candidates made the mistake of writing only about the first three words of the given topic. They wrote about a happy family, very often personalising it, and never wrote about how a happy family influences society. This cost candidates marks, as they missed the gist of what was required. Unfortunately, some candidates also chose to write about what a happy family is NOT – describing horrifying events which took place within a family and in the process misinterpreting the topic entirely.

(e) Candidates once again seemed reluctant to choose the visual stimuli (Q1.7), but those who did very often wrote excellent, very creative and thought-provoking essays. In a few cases, essays did not show a link to the picture, indicating that candidates chose the question even though they did not fully understand it. Some candidates neglected to give their essays titles.

(f) Candidates sometimes failed to convey their ideas successfully because their basic writing skills were lacking.

Suggestions for improvement

(a) Teachers should ensure that their learners know how to analyse and interpret the entire topic so that all aspects will be covered in the response. Learners should not be encouraged to zoom in on a single word in a topic! If there is any aspect of a topic about which a candidate is uncertain, he/she should choose another topic. A practical hint is to teach learners to underline all the nouns/key words in a topic. If candidates had done this in Q1.5, they would have realised that both education and character are important; the same is true of family, foundation and society in Q1.6.

(b) Learners must be exposed to the different types of essays and given opportunities to practise them. When administering SBA tasks, teachers should not neglect the aspect of providing learners the opportunity to exercise choices, as this in itself, is an important skill. If they are given more than one option when doing a task, the learners will be able to study the options carefully and choose the one most suited to their experience, ability and style of writing.

(c) Learners should receive guidance on how to interpret visual texts. This can only happen by exposing them to pictures and allowing them to practise in class, even if this exercise does not lead to an entire essay being written every time. Learners will benefit from this as it will take away the element of surprise at finding visual stimuli in the examination, and it may open up a wealth of creative possibilities.

(d) The aspects of creativity and originality often make the difference between a good and an excellent essay. Learners must be taught that their first idea may probably be everybody else's first idea and therefore not original. Teaching learners to be original and creative in their writing is a challenge teachers should embrace. It is often the learner with the limited language ability who has a knack for thinking out of the box, and thus can earn some valuable marks.

(e) The correct structure of an essay is important and should be taught. The planning stage of the essay is essential for this. A striking introduction and strong conclusion are hallmarks of good writing.

(f) Editing should be an integral part of the draft stage. If the draft and final copy of an essay are identical, the planning did not serve the required purpose. Learners must re-read their work and eliminate incoherence and other mistakes.

(g) Concord, spelling, sentence construction and all other language skills must be taught, studied and used to improve writing. This can be further enhanced by using figurative language and rhetorical devices.

SECTION B: Longer Transactional Pieces

(a) The friendly letter (Q2.1) and the dialogue (Q2.4) were very popular choices. It remains a cause for concern, however, that basic mistakes in format are made in the letter and that some candidates still use quotation marks in the dialogue. A mistake made in both these pieces was the tone – candidates seemed to be unable to create an informal, conversational tone.

(b) The inclusion of the covering letter in this question paper had mixed results. Candidates who followed the instructions did very well, using and manipulating the given information to their advantage. Some candidates, however, did not understand what they had to do and inserted their own names and details. The lack of skill and knowledge in writing a formal letter was apparent in many responses as the format was often quite wrong.

(c) Not many candidates opted for the magazine article, which might indicate that it was not commonly taught or that learners had limited access to this form of media.

Suggestions for improvement

(a) Learners should get ample opportunities to write different pieces, listen to one another's efforts and refine the skills they acquire.This practice should help them identify and create a suitable tone for the specific piece they are required to produce.

(b) Teachers should provide their learners with correct examples of texts and format so that they can prepare for this paper.Sending learners into a final examination without the necessary knowledge of the format is inexcusable.

(c) The CAPS document is clear on all the different transactional pieces that must have been taught by the end of Grade 12. Teachers must expose learners to all of these so that the choice is not unfairly limited when it comes to the final examination.

(d) In order to produce logically structured, coherent pieces, learners should be taught (and, if necessary, forced) to plan, proofread and edit their work.

SECTION C: Shorter Texts

(a) The diary entry (Question 3.2) was the most popular choice and candidates wrote well, describing personal thoughts and feelings. A common mistake was the omission of any reference to the teacher, with candidates merely writing about their own turmoil and its resolution.

(b) Candidates who did not fare well in Q3.1 (the poster) were those who did not include the relevant information listed in the CAPS document (e.g. catchy headline or slogan, persuasive language etc.). Some candidates appeared not to have understood 'recycling' and confused it with cleaning up.

(c) Question 3.3 (instructions) elicited some good responses, but some candidates ignored the second part of the topic – how to deliver the speech. It also seemed that some candidates had difficulty in presenting the instructions in a logical sequence.

(d) Some candidates did not make use of any planning or editing, despite having done so in the other sections. Some went about their responses without much attention to correct language usage and very often these responses were extremely short, even shorter than 50 words.

Suggestions for improvement

(a) Learners must read and analyse the topic of their choice, underlining key words and using them to ensure that all requirements of the topic are met.

(b) The formal and language conventions applicable to all texts listed in the CAPS document must be taught and learners must practise them, using correct and well-written examples.

(c) This section can boost the candidates' marks, as the pieces are relatively easy and in many cases they can get away with not writing in full sentences. For this reason, candidates must be discouraged from treating this section as relatively unimportant. The same attention to planning and editing should be given to this last piece as to the other two.

(d) Time management should be emphasised and practised as running out of time might have been the reason for the lack of attention to detail which often cost candidates marks as they appeared to have rushed in this last section.

CHAPTER 7: GEOGRAPHY

The following report should be read in conjunction with the Geography question papers of the November 2016 (NSC) Examination.

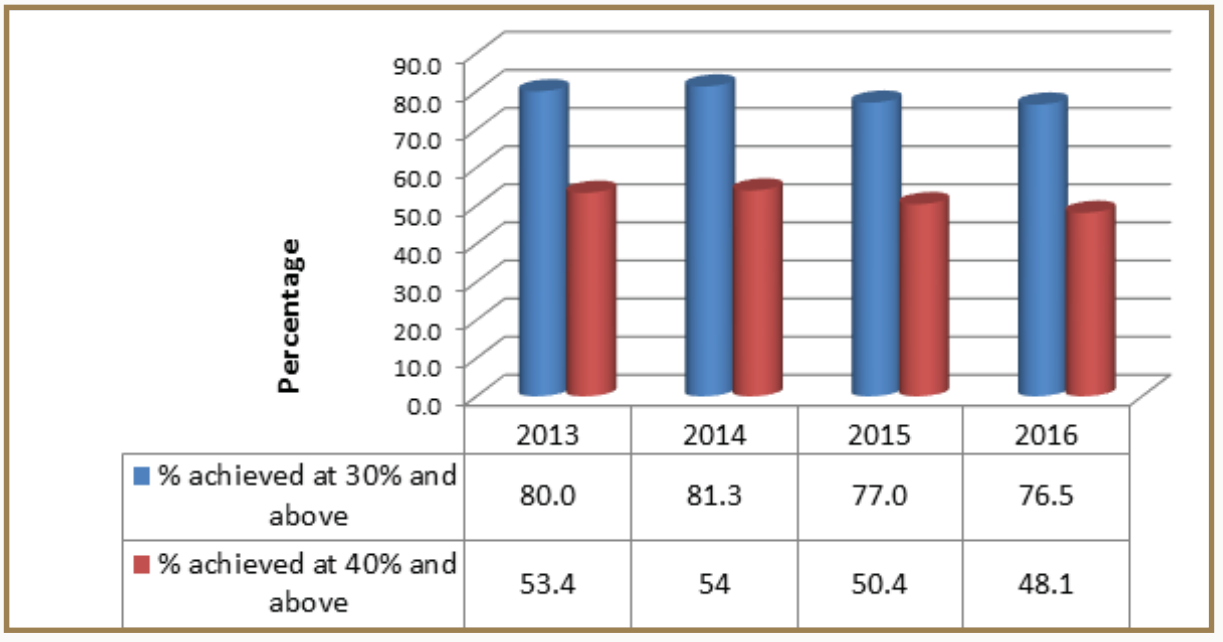
7.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates decreased by 1 303 relative to the 2015 enrolment. The general performance of candidates declined slightly this year as indicated by 76,5% of candidates achieving at 30% and above, with 48,1% achieving at 40% and above.

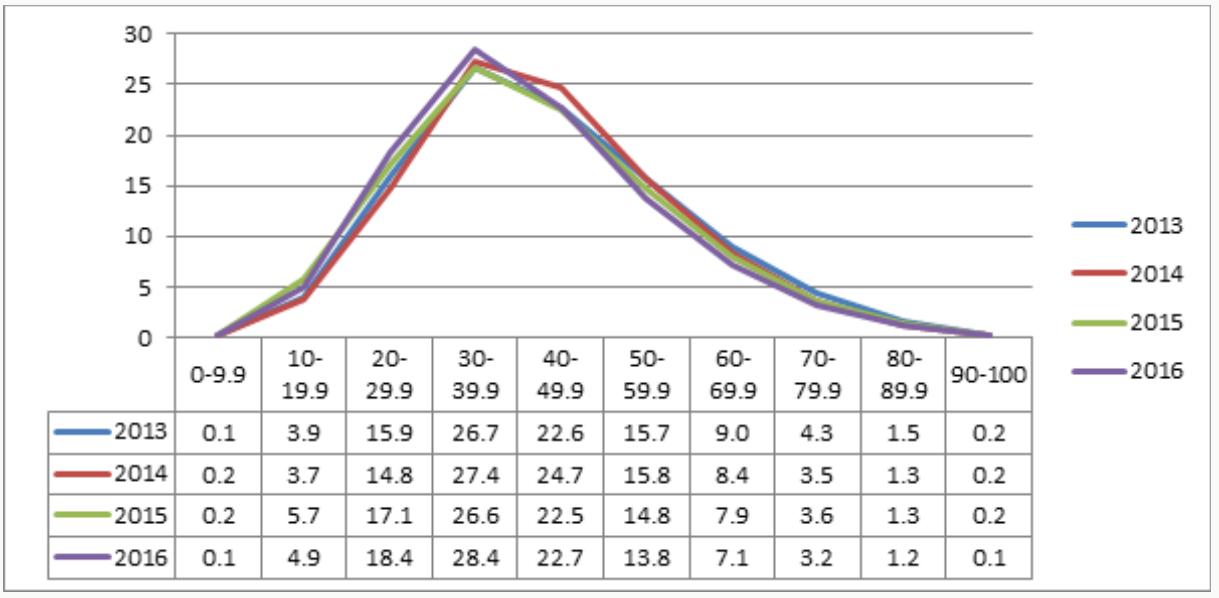
Table 7.1.1 Overall achievement rates in Geography

YEAR	NO WROTE	NO. ACHIEVED AT 30% AND ABOVE	% ACHIEVED AT 30% AND ABOVE	NO. ACHIEVED AT 40% AND ABOVE	% ACHIEVED AT 40% AND ABOVE
2013	239 657	191 834	80,0	127 873	53,4
2014	236 051	191 966	81,3	127 358	54,0
2015	303 985	234 208	77,0	153 212	50,4
2016	302 600	231 588	76,5	145 696	48,1

Graph 7.1.1 Overall achievement in Geography



Graph 7.1.2 Performance distribution curves in Geography



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.1	3.9	15.9	26.7	22.6	15.7	9.0	4.3	1.5	0.2
2014	0.2	3.7	14.8	27.4	24.7	15.8	8.4	3.5	1.3	0.2
2015	0.2	5.7	17.1	26.6	22.5	14.8	7.9	3.6	1.3	0.2
2016	0.1	4.9	18.4	28.4	22.7	13.8	7.1	3.2	1.2	0.1

From the above and aforementioned graphs, it is evident that there has been a disappointing decline in the performance of candidates in 2016.

7.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

General comments

Unfortunately, many of the same findings were highlighted and discussed in the Diagnostic Report of 2015, but these repeated trends remain as areas of concern in the context of the 2016 NSC paper as well and require focus and emphasis once again.

(a) The biggest downfall of candidates remains the lack of content knowledge. Many candidates struggled to define basic geographical concepts. Those candidates were then not able to answer the set of higher order questions that followed after the definition. The geographical vocabulary of candidates is also very poor.

(b) Candidates had difficulty in answering questions that contained action words which required a higher level of thinking. The following were examples which proved challenging: 'evaluate', 'account for''discuss', 'describe' and'explain'. This resulted in inappropriate answers which reflected an inability of the candidates to respond to the higher cognitive demand of such questions, for example, candidates would list facts but not provide an explanation when asked to 'explain'.

(c) Although candidates showed a greater level of skill in interpreting diagrams in the source material, they still struggled to demonstrate creative responses when drawing annotated diagrams to explain processes.

(d) In most cases, paragraph-style questions were still poorly answered. It is evident that candidates were not taught the necessary skills to interpretthe content knowledge to answer this type of question. Many paragraph questions contained two components that needed to be answered. A number of candidates focussed on the first component only and therefore could not achieve full marks. Some candidates did not always heed and formulate responses to the action words used in these questions.

(e) Although fewer cases have been noted this year, some candidates still completed all 4 questions despite having been given very clear instructions that only 3 questions are to be selected. These cases were, however, restricted to Part-Time candidates.

General suggestions for improvement

(a) Teachers must ensure that learners know all the geographical definitions required by assisting the learners to compile a glossary of terms in their notebooks for easy and regular reference.

(b) Learning geographical definitions will assist learners in attaining the required geographical vocabulary. Teachers should emphasise the use of geographical language in answering questions, for example using 'north' and 'south', and not 'top' and 'bottom',when discussing direction.

(c) Learners must have a clear understanding of the basic concepts taught in Geography. These should be mastered through repetitive, formative tests and regular homework exercises to reinforce and extend the content knowledge.

(d) Before dealing with important concepts and new content in class, teachers must ensure that they are up-to-date on the relevant topical issues in order to cover them effectively. If, for example, a geographical problem is stated, learners should study the causes and effects of the geographical problem, as well as, possible solutions to it. An in-depth knowledge of such issues is required by the teacher, and this mighthave to involve informal research as part of the lesson planning.

(e) Teachers must be encouraged to collect resources on an ongoing basis andbe aware of current events that are taught in Grade 12. This is especially true for the human geographical issues; for example, changes in the urban and economic environments. These should then be incorporated into lessons to ensure that lessons are topical and relevant to learners. As life-long learners, teachers must stay abreast of new developments in their subject. These changes could be incorporated as contextual questions into internal tests or examinations.

(f) Teachers are advised to research the topics that are commonly examined and ensure that content is taught accurately. Teachers should set questions on a particular topic from a variety of different perspectives to prepare learners to be competent in approaching a particular topic from any angle or point of view.

(g) Teachers must use source-based questions in class assignments, tests and examinations. They must make use of relevant and recent resources from the internet and avoid using only sources that appear in textbooks and those familiar to learners. Resources must vary in nature. The following types of sources are commonly used in Geography examination papers: line sketches, photographs, line graphs, bar graphs, pie charts, tables, cartoons and newspaper extracts. These sources could also be used in combination with one another.

(h) Learners should be taught to interpret the implied meanings of cartoons. The purpose of using cartoons is to evoke an emotion from the person studying the cartoon. Teachers and learners alike must be alerted to the fact that these emotions will vary from person to person, and this should be taken into account when marking questions based on cartoons.

(i) Teachers should be fully aware of the relevant subject content to be taught by constantly referring to the CAPS and ExaminationGuidelines for Geography. Not all prescribed textbooks always contain all the subject content mentioned in the above documents. Teachers should,therefore,consult more than one textbook if possible.

(j) Teachers should provide each learner with a copy of the Examination Guidelines, which can be used as a guide or pace setter to ensure all content is covered and to assist in preparing for tests/examinations.

(k) Candidates continue to struggle with those action words that are of a higher cognitive demand. Questions containing these cognitive verbs should be answered in full sentences, showing a clear knowledge and understanding of geographical content. The action/cognitive verbs listed in the table below are commonly used in Geography examination papers. Please note that this is not a comprehensive list of action / cognitive verbs. Comprehensive lists were provided in the 2014 and 2015 diagnostic reports, and teachers should refer back to those reports.

Table 6.2.1 Action / Cognitive Verbs and their expected responses

VERB	MEANING
Account	to answer for - explain the cause of - so as to explain why
Analyse	to separate, examine and interpret critically
Annotate	to add explanatory notes to a sketch, map or drawing
Comment	to write generally about
Compare	to point out or show both similarities and differences
Construct	to draw a shape
Describe	to list the main characteristics of something - give an account of
Develop	to successfully develop and create a new method/idea
Differentiate	to show the difference between things
Discuss	to examine by means of argument, presenting both sides and reaching a conclusion
Distinguish	to recognise the difference between things
Draw	to show by means of a sketch
Evaluate	to make an appraisal or express an opinion concerning the value - to define, analyse and discuss
Explain	to make clear, interpret and spell out the material you present
Illustrate	to show what something is like - to show that something is true
Justify	to prove or give reasons for decisions or conclusions, using logical argument
Outline	give a summary, using main points and leaving out minor details
Predict	to say what you think will happen - to foretell - to say in advance
Prioritise	to place in order of importance
Propose	to suggest a plan - to make a formal suggestion
Recommend	to advise that something should be done
Report	to produce an official statement or written document
Sketch	to illustrate with a simple drawing
Solve	to find a solution to something that is causing difficulties
Suggest	to propose an explanation or solution
Support	to show that an idea/statement is true
Verify	to check/prove that something is correct
Write	to create a formal document

(l) To improve learner performance, teachers must use previous examination papers as a guide to ensure that the standard of questions used in the assessment at school level is appropriate. This would also assist teachers to acquaint candidates with the style of question-setting and how questions are scaffolded, from those testing lower order cognitive skills, to the higher-order questions testing more advanced thinking skills. Previous question papers must not, however, be used as a predictability tool or to promote rote learning. Similar topics may be regularly covered, but might be tested from a different perspective.Teachers are reminded that all content must be taught and at no time should sections of content be left out at their own discretion.

(m) Teachers must ensure that the distribution of marks in the internal assessment tasks is according to the requirements in the CAPS document.The weighting is 25% lower order, 50% middle order and 25% higher order. If too many lower-order questions are asked in the internal assessment conducted at school, learners will not be exposed to the higher-order questions that are asked in the final examination and will therefore have a false notion of the level of performance required to succeed at their targeted achievement level.

(n) Teachers are encouraged to use a variety of new, interesting and current sources on which to base their questions. If sources are derived solely from the textbook in use at a particular school, learners are not exposed to unseen new sources that they might come across in an external examination. Exposing learners to new sources continually, trains them to critically analyse any sources to which they are exposed.

(o) Teachers should focus on the interpretation of diagrams, sketches, photographs, cartoons and graphical data. The learners should be taught how to draw on information from these different sources. Teachers and learners must be aware that different sources may also be combined for examination purposes.

(p) Where alternative terms exist for a specific concept, learners must be provided with all possible terms and not only the term preferred by the teacher.

(q) Learners should be taught paragraph-writing and interpretation techniques. The high number of learners who scored no marks in these questions is an area of concern. These questions usually require critical and analytical thinking, which places them on a higher level of cognitive demand. Candidates cannot therefore merely reproduce knowledge gained in the classroom. Responses should be well thought through and adapted to the source given. Although it is expected of candidates to answer these questions in full sentences, the answer should be to the point and focus on the intent of the question. Teachers MUST insist that the candidates limit their answers to the prescribed 8 lines. Many paragraph questions contain two components that must be referred to, and this should be done in equal parts.

It is useful in a paragraph-style question to underline the following: the *main topic* of the question, the *action word* and the *focus areas* of the question. The following question in the 2016 examination paper is used as an example: 'In a paragraph of approximately EIGHT lines, evaluate the effect that urban sprawl will have on the natural environment at **A** in 2020.' It would be useful to start the paragraph with a short definition of urban sprawl. The candidate must then appraise (assess) the impact of urban sprawl on the natural environment. The question requires a certain degree of prediction/projection. The candidate therefore has to use his/her knowledge of the impact of urban sprawl to make the projection.

Areas which need attention are the repetition of facts and poor punctuation. Regular practice of these in short informal and formal tests, as well as in internal examinations, will allow the learners to improve these skills and be confident in attempting these questions.

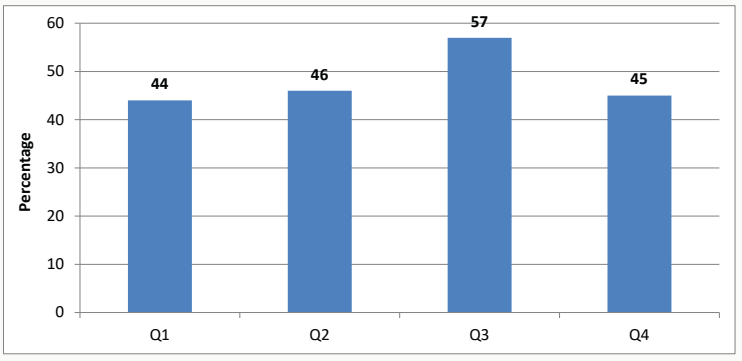
(r) Many learners do not read the questions properly. They see common words and fail to determine what the question actually requires. Learners should be guided in developing techniques for the interpretation of questions e.g. the practice of underlining key words. The above action-word guide (k) should be reinforced by teachers when marking learners' responses and when providing feedback to learners. No credit should be given for simple single-word responses when a full explanation is required.

(s) Teachers must note that the short subjective questions (15 marks) at the beginning of each of the 4 questions are not necessarily only going to test lower-order thinking skills and straight-forward recall. Some questions might require higher order thinking.

7.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

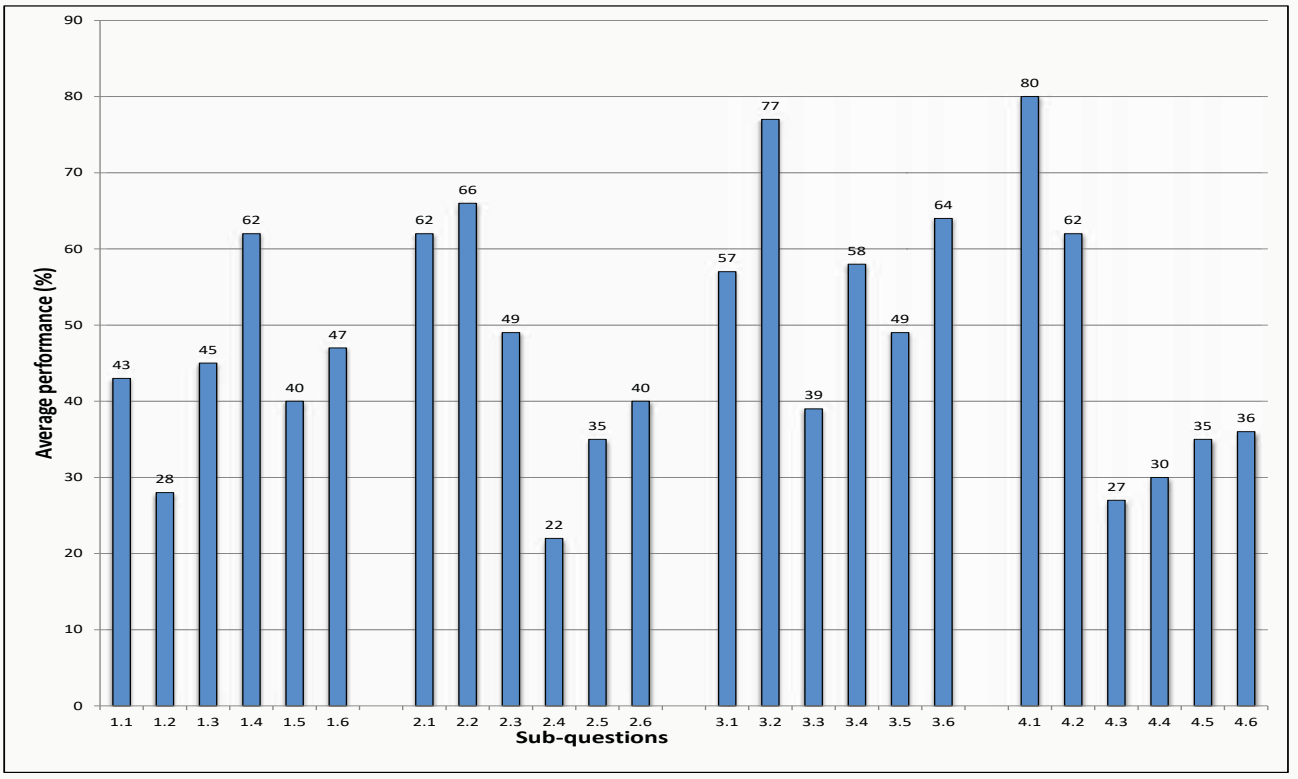
The following graph is based on data from a random sample of 100 candidates per province. While this graph might not accurately reflect national averages, it is useful in assessing the relative degree of challenge of each question as experienced by candidates.

Graph 7.3.1 Average marks attained per question as a percentage in Paper 1



Q1	Climate and Weather, and Geo-morphology
Q2	Climate and Weather, and Geo-morphology
Q3	Rural and Urban Settlements, and Economic Activities of South Africa
Q4	Rural and Urban Settlements, and Economic Activities of South Africa

Graph 7.3.2 Average marks attained per question as a percentage in Paper 1



7.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

QUESTION 1: CLIMATE AND WEATHER AND GEOMORPHOLOGY

Common errors and misconceptions

(a) Many candidates struggled with Q1.1 and Q1.2 owing to the directness and higher cognitive demand of these short objective questions.

(b) In Q1.3.1, candidates could not identify the conditions necessary for berg winds to form. Candidates were not able to draw a cross-section (Q1.3.2) to explain the development of a berg wind from a higher pressure at the top of the valley. In Q 1.3.4, candidates needed to explain in detail, in a paragraph, the threat of berg winds to farming communities. This they could not do. Many candidates suggested that berg winds cause veld fires, but in fact they cause the vegetation to be dry and more likely to catch fire: berg winds can then help to spread the fire.The misconception, that a berg wind can cause veld fires, needs to be corrected as explained above.

(c) Q1.4.3 asked for 'severe' weather conditions, and not just general weather conditions. Many candidates lost marks because of this. Candidates could also not explain the difference in weather conditions at Cape Town and Mossel Bay (Q1.4.5), as they could not see the relationship between the location of these two places and the passage of the mid-latitude cyclone.

(d) Many candidates were not able to determine the stream order as required in Q1.5.4. Furthermore, they were not able to state the relationship between stream order and characteristics of stream segments as referred to in Q1.5.5.

(e) Candidates could not unpack all the processes involved in a graded profile required in the paragraph question in Q1.6.5. They were unable to explain how the processes resulted in the specific gradients mentioned in the upper course or lower course. Most of them knew that erosion and deposition play a role, but could not elaborate any further.

Suggestions for improvements

(a) Teachers must note that short objective questions will not only comprise of lower order questions.

(b) Learners should be taught to be specific when answering questions related to a particular topic. Teachers must teach the specific conditions needed for the development of specific weather/climatic phenomena. The weather conditions associated with these specific climatic/weather phenomena must also be emphasized continually.

(c) Candidates must be able to draw annotated (labelled) diagrams to explain the development of any geographical phenomena. Teachers must apply this technique when teaching in class by insisting on learners' drawing various diagrams, and not merely referring to and examining annotated diagrams in text books.

(d) Note that berg winds are associated with veld fires, but they do not cause it. They cause hot and dry conditions that are conducive to the occurrence of veld fires. These veld fires will have a negative impact on farming communities along the east coast of South Africa

(e) When asked for relationships, candidates must be specific in their answers. For example, when stating the relationshipbetween stream order and the length of streams: the higher the order of the stream, the longer the stream. Candidates cannot merely state that the relationship is directly proportional.

(f) The processes responsible for the graded and ungraded river profiles should be taught and not merely the characteristics thereof. Teachers must always focus on the geographical processes involved in the formation of geomorphological features.

QUESTION 2: CLIMATE AND WEATHER AND GEOMORPHOLOGY

Common errors and misconceptions

(a) Candidates interpreted the paragraph question 2.3.5 incorrectly. The question specifically refers to a climatic point of view whereas many candidates referred to flooding.

(b) Candidates do not know how the Kalahari High Pressure Cell influences weather conditions over the interior of the country (Q2.4.3(b)). High pressure cells do not cause cold temperatures but rather warm temperatures due to descending air.

(c) Q2.4.4 was poorly answered. Candidates could not provide a reason for the wind direction. Many candidates could not identify the wind as a berg wind, therefore they were unable to explain the high temperatures experienced at weather station X.The high temperatures were explained in terms of the warm ocean, and not the adiabatic heating of subsiding air as a result of the berg wind.

(d) Generally, Q2.5 was poorly answered. Candidates could not provide a correct definition for a drainage pattern (Q2.5.1). In Q2.5.4, the relationship between underlying rock structures and drainage pattern was not understood, and therefore comparisons could not be made. As very few candidates knew which drainage pattern would develop in a folded landscape, they could not draw the labelled diagram required (Q2.5.5).

(e) In Q 2.6.2(b), many candidates could not explain why flooding is more likely at the confluence of two rivers in Q2.6.4. This question required higher order critical thinking and was poorly answered. Most candidates referred to the negative aspects of flooding, even though the question focused on the positive role of flooding.

Suggestions for improvement

(a) Learners must be taught the skills required for the reading and interpretation of questions. Often a question focuses on a specific issue, such as a climate's detrimental effect on a site. Learners should be taught how to answer by focusing on the key concepts required by the question, and not simply write down what they know. By underlining key concepts in the question, candidates would be able to focus on what the question requires.

(b) The Kalahari High Pressure Cell plays a major role in determining weather conditions over the South African interior. The positioning and height above the Escarpment must be taught in depth, as this has an impact on the flow of moist air to the interior of the country.

(c) Wind direction must be taught in relation to air rotation around pressure cells (clockwise around low pressure cells and anti-clockwise around high pressure cells in the Southern Hemisphere). If air movement is from the land to the sea, berg wind conditions are indicated. The latter, results in high temperatures along the coast as air subsides down the escarpment and is heated adiabatically.

(d) The development of drainage patterns must be taught in relation to the underlying rock structure, as this determines how streams will flow in relation to one another on a specific landscape. Candidates must be able to draw any of the drainage patterns that are studied in Grade 12.

(e) Paragraph-style questions require critical thinking. In determining the positive role of flooding in a river, candidates must apply their knowledge.Floods would remove pollutants and excess deposited material and this would help sustain the health of the river. At the same time, fertile soil would be deposited on the surrounding flood plain.

QUESTION 3: RURAL AND URBAN SETTLEMENTS, AND ECONOMIC GEOGRAPHY OF SOUTH AFRICA

Common errors and misconceptions

(a) Candidates struggled with Q3.3.4. They could not explain how the decision to upgrade the road changed the classification of the village in the urban hierarchy. It appears candidates do not understand the concept of urban hierarchy.

(b) Candidates confused the term,'informal settlements' with informal trading (Q3.6). In Q3.4.5 candidates could describe the activities of inhabitants in informal settlements, but they were not able to evaluate the impact of these activities on the environment.

(c) In the paragraph question 3.5.4, candidates did not discuss both focus areas, but concentrated only on one. They had difficulty differentiating between the direct and indirect contribution of mining to the GDP. Many interpreted indirect contributions as disadvantages, which was incorrect.

Suggestions for improvement

(a) When urban hierarchy is taught, emphasis should also be placed on how and why settlements can change their position in the urban hierarchy.

(b) Although a relationship exists between informal settlements and informal trade, there is a clear difference between the two concepts. Teaching about informal settlements should be in terms of cause and effect. Learners must not only know the characteristics of informal settlements. When informal settlements develop, they have an enormous impact on the natural, economic and social environments. This impact, whether positive or negative, must be clearly understood.

(c) The direct contribution of mining is always well taught and clearly understood. However, the indirect contribution of mining to the GDP is often neglected in the teaching of this section. Processed raw materials also contribute to the GDP, as do tertiary services that develop as a result of mining. This indirect contribution plays a major role in South Africa's economic development and should therefore be emphasised.

QUESTION 4: RURAL AND URBAN SETTLEMENTS, AND ECONOMIC GEOGRAPHY OF SOUTH AFRICA

Common errors and misconceptions

(a) Candidates struggled with Q4.3, which dealt with urban expansion. It appears that teachers taught only the concept of urban expansion, and did not discuss the reasons and consequences thereof. Candidates clearly struggled with the term,'centrifugal forces' (Q4.3.3) and the consequences thereof.

(b) Questions on the topic of urban sprawl were not well-answered in Q4.4. Candidates identified the correct street pattern (Q4.4.4), but could not provide a reason for it. Q4.4.5 was poorly answered as candidates did not refer to the natural environment and could not link urban sprawl to having a negative effect on this environment.

(c) Candidates struggled to state the relationship asked for in Q4.5.3 as they failed to interpret the two sets of data provided in the source material. As a result, candidates also struggled to answer Q4.5.4.

Suggestions for improvement

(a) When urban expansion is taught, emphasis should also be placed on the reasons for it. Centrifugal forces are central to this topic as urban expansion is often the result of negative forces in the inner city that result in people's moving to the outskirts of the city.

(b) Urban sprawl must be taught in terms of cause and the effect. As the urban area spreads into the surrounding natural environment, it has a negative impact on that environment. The impact of urban sprawl must therefore be understood, and candidates should also be able to provide solutions to prevent urban sprawl.Identifying relationships is one of the key elements of Geography. Learners must therefore become skilled in observing and explaining relationships between two entities. The interpretation of diagrams is essential in establishing these relationships. Teachers should provide learners with different sets of data and teach them how to determine, describe and explain relationships that are evident. This should be done regularly in order for learners to become well-versed in this type of question.

7.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

General comments

(a) Middle- to higher-order questions continue to be a great challenge to the candidates. Action/cognitive verbs are not understood correctly. Many candidates did not know how to approach those questions in which they did not understand what was expected of them.

(b) Candidates are disadvantaged because they do not read instructions, or use the given information to support their responses.

(c) A basic knowledge of calculations is lacking. It appears that many teachers are not well-versed in the various calculation techniques or that not enough time is spent consolidating this aspect of mapwork.

(d) Candidates do not follow logical sequencing when calculations are done. They also continue to have a tendency not to indicate the correct unit of measurement in their final answers.

(e) The teaching of map and photo interpretation skills must be taught, using both a topographic map and an orthophoto map. Teachers must ensure that all topographic maps and orthophoto maps from past final examinations are kept safely at school. These topographic and orthophoto maps are valuable resource materials that should be engaged with on a regular basis.

(f) In response to QUESTION 3, where practical application was required, candidates tended to refer to personal experiences, rather than interpretation of the topographic map or the orthophoto map.

(g) The integration of theory and mapwork skills cannot be emphasised enough. Learners must be made aware that Geography Paper 1 and Geography Paper 2 are inter-related and not two separate entities. When certain concepts are taught in the theory section of Geography, this knowledge must be applied in the mapwork paper.

(h) The fundamental knowledge of GIS is lacking. It seems as if many teachers are not familiar with GIS and are merely teaching definitions but not the application of the techniques and skills.

General suggestions for improvement

(a) Teachers should equip learners to locate the orthophoto map of a specific area on the topographic map, using latitude and longitude. The area covered by the orthophoto map is usually indicated as a red demarcated area on the topographic map. Learners must be made aware that even though the orthophoto map and the topographic map are similar in size, the orthophoto map represents a much smaller landscape in reality than the topographic map. Understanding the concept of scale is important. The topographic map has a scale of 1: 50 000 and the orthophoto map a scale of 1: 10 000. This means that the orthophoto map will show a feature to be 5 times larger than the same feature on the topographic map.

(b) Learners must be taught to recognise subtle differences in the options given in a multiple-choice question. Teachers should be trained in the correct way of setting multiple-choice questions. Teachers and learners should be aware that the multiple choice questions are not only testing simple recall, but can include middle- and higher-order cognitive skills testing.

(c) The theory of Climatology, Geomorphology, Settlement and Economic Geography of South Africa must be taught by integrating content with topographic maps and orthophoto maps of South Africa.

(d) The integration of theory and mapwork is essential and must be taught concurrently. Teachers should emphasise the importance of using the correct geographic terminology in tests and examinations. For example, candidates often use words such as 'left' and 'right' instead of 'north', 'south', 'east' or 'west'.

(e) Teachers must be trained in mapwork calculation techniques and GIS. When teaching calculations, a step-by-step correct geographical method should be followed.

(f) Learners must know that, in order to identify a human-made and/or natural feature on an orthophoto map, the same feature must be located on the topographic map first. It is therefore important that the orthophoto map and the topographic map be correctly orientated. Once this has been done, learners must find similar-looking features on both the orthophoto map and the topographic map as points of orientation. Learners must be reminded that the distances between features on the orthophoto map will be much greater than the distances between the same two features on the topographic map, as the scales of the two maps differ.

(g) Learners must understand that human-made features tend to have a more regular shape than a natural feature.

(h) All schools should have a variety of topographic maps and orthophoto maps available as invigilators are instructed to collect these resources at the end of the examination. Teachers should use these resources and examination papers for the purpose of practising in class. All NSC examination papers can be used for revision in CAPS as the content remains the same. Previous question papers must not, however, be used as a predictability tool. Paper 2 allows for creativity and teachers and candidates alike must expect new approaches in the examination.

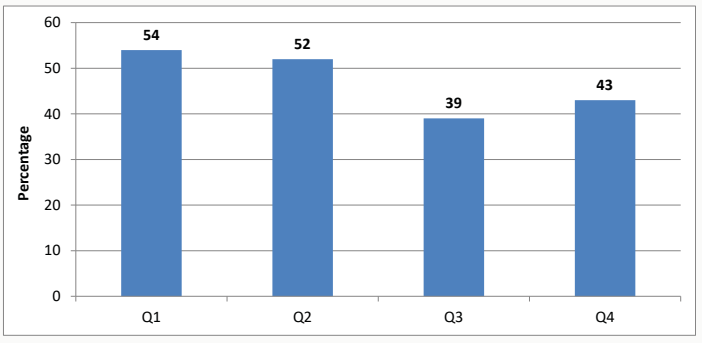
(i) Teachers must give learners regular exercises for practice of map reading and interpretation skills.

(j) Teachers should expose learners to previous examination papers where similar questions and questions of the correct difficulty levels are provided.

7.6. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

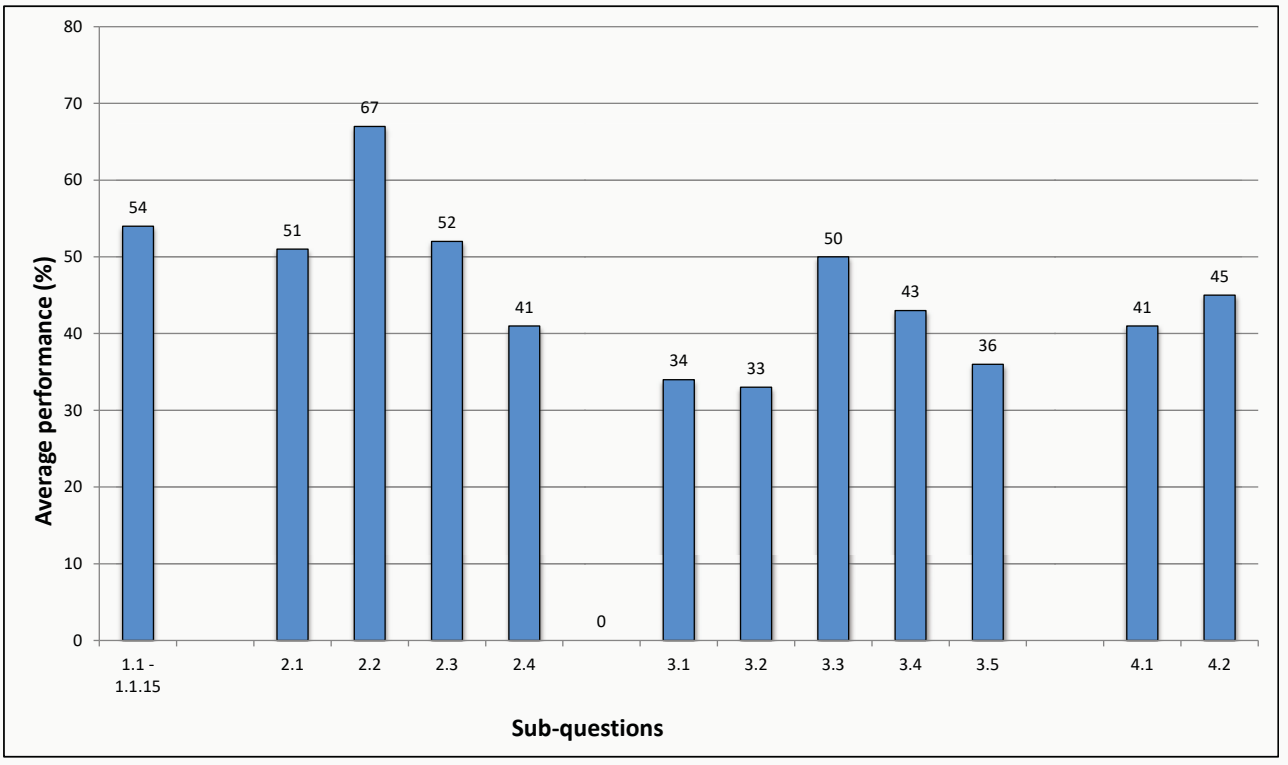
The following graph was based on data from a random sample of candidates per province. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Graph 7.6.1 Average marks per question as a percentage in Paper 2



Q1	Multiple Choice
Q2	Map Calculations and Techniques
Q3	Application and Interpretation
Q4	Geographical Information Systems

Graph 7.6.2 Average marks per sub-question as a percentage in Paper 2



7.7. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Common errors and misconceptions

(a) Q1.2: Candidates did not have the skill to determine true bearing on the orthophoto map. Candidates did not know from which point the true bearing must be measured; they measured from 2 instead of 1.

(b) Q1.5: Candidates struggled to determine stream order.

(c) Q1.7: Candidates did not take the entire area referred to into account when determining the stream pattern, but rather some of the streams individually.

(d) Q1.13: Candidates struggled with the concept of land-use zones, and could not identify the land-use zone in which Jubapark is located.

(e) Q1.15: Candidates could not classify Volksrust as a central place town.

Suggestions for improvement

(a) The centre of the protractor must be placed on the point FROM which the true bearing must be measured.

(b) Theoretical concepts are always tested in Paper 2. These concepts must be applied to topographic maps and orthophoto maps as they are taught. Different topographic maps and orthophoto maps must be used to ensure that learners are well-prepared for the Paper 2 examination.

QUESTION 2: MAP CALCULATIONS AND TECHNIQUES

Common errors and misconceptions

(a) Q2.1.2: Candidates could not explain that if the mean annual change is westwards, the magnetic declination will increase.

(b) Q2.3.2: Candidates struggled with interpretation of gradient; they do not understand the vertical and horizontal dimensions and the link between the two.

(c) Q2.4.1: Most candidates lacked the skill to transfer and indicate the position of specific features on the cross-section.

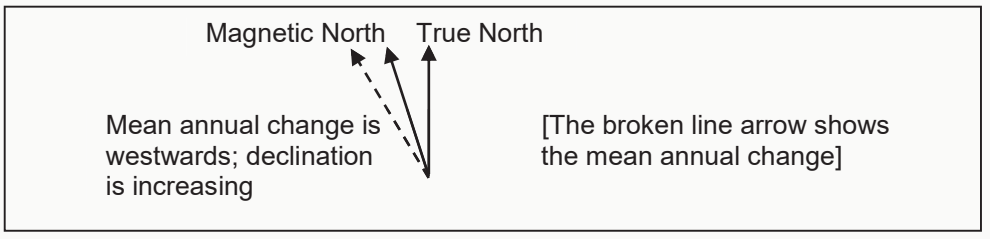
(d) Q2.4.3: Calculating vertical exaggeration is a big challenge for most candidates. They do not understand the sequencing of steps to reach the final answer.

(e) Candidates generally continue to struggle with calculations and they neglect to show the different steps they have followed. Candidates are credited for each correct step.

(f) All calculations and final answers must include the required units of measurement or no marks will be awarded for that step; for example,metres (distance), m² (area), West of true North (magnetic declination).

Suggestions for improvement

(a) Information needed to determine present magnetic declination and magnetic bearing is indicated in the margin of the map. If the change is westwards, it means that magnetic north is moving westwards in relation to true north, thus the declination (angle) between magnetic north and true north is increasing.



(b) Two gradients, 1**:** 24 and 1**:** 58, were given in Q2.3.2. Gradient shows the relationship between the horizontal distance travelled, and by how much one rises over the horizontal distance travelled. In gradient, the value of 1 always indicates the rise over distance travelled. The distance travelled varies depending on the two points between which one travels. A gradient of 1: 24 thus means that for every 24 metres travelled horizontally, one will rise by 1 metre. A gradient of 1: 58 therefore means that for every 58 metres travelled horizontally, one will rise by 1 metre. The greater the distance travelled horizontally, the more gradual the gradient (more gentle the slope). A gradient of 1: 58 is therefore more gradual than a gradient of 1: 24. On a topographic map or an orthophoto map, the contour lines will be spaced much further apart from one another for a gradient of 1: 58 than for a gradient of 1: 24.

(c) Place a blank strip of paper between the two points along which the cross-section was drawn. Mark the exact position of features that you have to indicate on the cross-section on the blank strip of paper. Place the blank strip on the completed cross-section. Transfer the markings on the blank strip of paper onto the cross-section and put in the appropriate labels.

(d) Vertical exaggeration is calculated to show the difference in relief. If a cross-section is not vertically exaggerated it will almost appear as a flat line.

$$\textit{Vertical Exaggeration} = \frac{\textit{vertical scale}}{\textit{horizontal scale}}$$

The vertical scale is given as a word statement and has to be changed to a ratio scale. The cross-section in the question paper was drawn to a vertical scale of 1 cm represents 20 m. The vertical scale must be converted to a ratio scale. In order to determine the ratio of the vertical scale, 20 m must be converted to centimetres (as there are 100 cm in 1 m; 20 must therefore be multiplied by 100).

Therefore: vertical scale = 1 cm represents 20 m

= 1 cm: (20 x 100) cm

= 1:2 000

The horizontal scale is always the same as the map scale.

Therefore: horizontal scale = 1:50 000

To substitute the vertical scale and the horizontal scale into the formula, both must be converted to fractions.Therefore:

$$\text{Vertical Scale} = \frac{1}{2\,000}$$

$$\text{Horizontal Scale} = \frac{1}{50\,000}$$

The calculation can now be done by substituting the vertical and horizontal scales into the formula.

$$\text{Vertical Exaggeration} = \frac{\text{vertical scale}}{\text{horizontal scale}}$$

$$\text{Vertical Exaggeration} = \frac{\frac{1}{2\,000}}{\frac{1}{50\,000}}$$

$$= \frac{1}{2\,000} \text{ x } \frac{50\,000}{1}$$

$$= 25 \text{ times}$$

Remember to show all calculations as marks will be awarded for the correct steps. The unit of measurement for vertical exaggeration is times, as it shows by how much the vertical scale has been enlarged in relation to the horizontal scale.

QUESTION 3:

APPLICATION AND INTERPRETATION

Common errors and misconceptions

(a) Q3.1.2: Candidates assumed that silos are associated with agriculture and farming, therefore classified it as a primary economic activity.

(b) Q3.1.4:Candidates were not familiar with the concept of radiation fog/mist and when they identified the source as a valley in the day, they immediately assumed it was anabatic flow.

(c) Q3.3.2:Candidates did not understand what was meant by 'practised extensively'.

(d) Q3.4.1(a): Candidates seemed to confuse shape with pattern. In some instances, candidates did not know the different shapes. Candidates described the shape of each building within the settlement instead of the general shape of the settlement. Q3.4.1(b): The shape of the settlement was confused with street pattern.

(e) Q3.4.2: Candidates gave general location factors for the site of settlements, and not those specific to the settlement on the topographic map.

(f) The lack of understanding of the concept of a central place town resulted in incorrect answers to Q3.5.1, Q3.5.2 and Q3.5.3. In Q 3.5.2, many candidates read 'how many roads', instead of 'how may the many roads'. Candidates thought this question was asking about the number of roads, and not the impact of the many roads.Candidates who did not understand the concept of'sphere of influence' therefore struggled with Q3.5.3, which followed on from the previous two questions.

Suggestions for improvement

(a) Learners must be carefully guided through the different types of activities which occur within each of the three economic sectors of activities. This could be done by using an example of a chain of events of similar activities. An example would be:

grape farming (primary) → wine making (secondary) → cellars for storage (tertiary)

(b) Microclimatic factors must be taught in correlation with mapwork as this type of question is regularly asked in the mapwork paper.

(c) Extensive or intensive farming practices are easily identifiable on topographic maps. If a large area is farmed, it is referred to as extensive. When a small piece of land is farmed to its maximum capacity, it is referred to as intensive.

(d) A clear distinction must be made between shape of settlement and street pattern. Shape refers to the outer shape of the settlement, and street pattern refers to the arrangement of streets in relation to one another within a settlement.

(e) In a mapwork examination learners must be taught to work with the information provided on both the topographic map and the orthophoto map. Questions are directed at the information for the specific settlement visible on the topographic map.

(f) The classification of settlement types on a topographic map is important. Learners must, however, be taught to give reasons for the classification of settlements. Therefore one cannot teach only the concept of different settlement types, but a detailed understanding of the development of the type of settlement is needed.

QUESTION 4:

GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Common errors and misconceptions

(a) Q4.1.1: Candidates could not define the term,'database'.

(b) Q4.1.2: This question was poorly answered. Candidates lacked the basic knowledge of the characteristics of aerial photos and orthophoto maps.

(c) Q4.2.1: It is clear that many candidates did not know how to do a paper GIS. Candidates did not use the key that was provided, and many did not draw all three contour lines.

(d) Q4.2.2: Most candidates were not able to identify the GIS processes.

(e) Q4.2.3: Candidates'responses were not specific to the question and listed all forms of vector data and not only lines.

(f) Q4.2.4: Most of the candidates did not plot **A** on the paper GIS as instructed in the question. They described the location rather than plotting it.

Suggestions for improvement

(a) Learners must be conversant with GIS terminology. Definitions are often asked as part of GIS.Teachers should encourage learners to make a glossary of GIS terms.

(b) Learners must be made aware of the characteristics and various uses of orthophoto maps. Orthophoto maps are useful tools in research as they provide clear, detailed and true images of reality.

(c) Paper GIS is the most basic concept that should be taught in GIS. Learners are made aware of a variety of GIS processes when producing a paper GIS; for example, data layering, data manipulation and data integration. Teachers should cover this method of testing in class exercises and tests.

(d) Learners must be made aware of all the GIS processes. They should not only know the concepts of the different GIS processes, but also why they are useful in GIS. The GIS processes can be practically applied when teaching paper GIS.

(e) Teachers must emphasise the difference between vector data and raster data. When vector data are used, data are stored as points, lines and polygons: for example, a topographic map. When raster data is used, data are stored as pixels: for example, an orthophoto map. All drawn maps will be examples of vector data, and all photographs will be examples of raster data.

(f) When teaching paper GIS the plotting of features is important. Teachers should explain to learners what it means to plot, and not to give a written answer when asked to plot. Plotting can be tested by way of a sketch map on which learners need to be able to fill in various required attribute data from the topographic map.

(g) GIS concepts must be taught in context. While it is important to know the concepts and be able to define them when required to, learners must be able to apply the concepts in practical life situations. Teachers must therefore be aware of the fact that GIS will not consist solely of theory and definitions but can be practically applied to the map examined.

(h) Teachers are advised to create scenarios to challenge learners to apply their understanding of concepts and to apply GIS knowledge across the various topics of the subject (integration) as follows:

- Learners could be required to apply GIS in flood prevention (buffering)
- Learners must be able to apply GIS in choosing a site for the development of a settlement or planned shopping centre (data layering)
- Learners must be able to create a new map from different types and sizes of maps (data integration)
- Learners must know that GIS can contribute to solving social and environmental challenges
- Learners must be aware that GIS can be used to manage various issues, for example, disasters and crime.

(i) Teachers must integrate GIS knowledge across the various topics of the subject. Learners could be asked to apply GIS concepts to Climate and Weather, Geomorphology, Settlement Geography and the Economic Geography of South Africa. This would help learners to see that GIS can contribute to meeting social and environmental challenges.

(j) There should be reference to previous question papers to get an idea as to how GIS questions are set. Teaching approaches should be adapted accordingly.

(k) Teachers should devote ample time to planning GIS lessons. The curriculum currently requires learners to know and apply the GIS concepts. In developing lessons, teachers should make it a priority to

CHAPTER 8: HISTORY

The following should be read in conjunction with the History question paper of the November 2016 NSC examination.

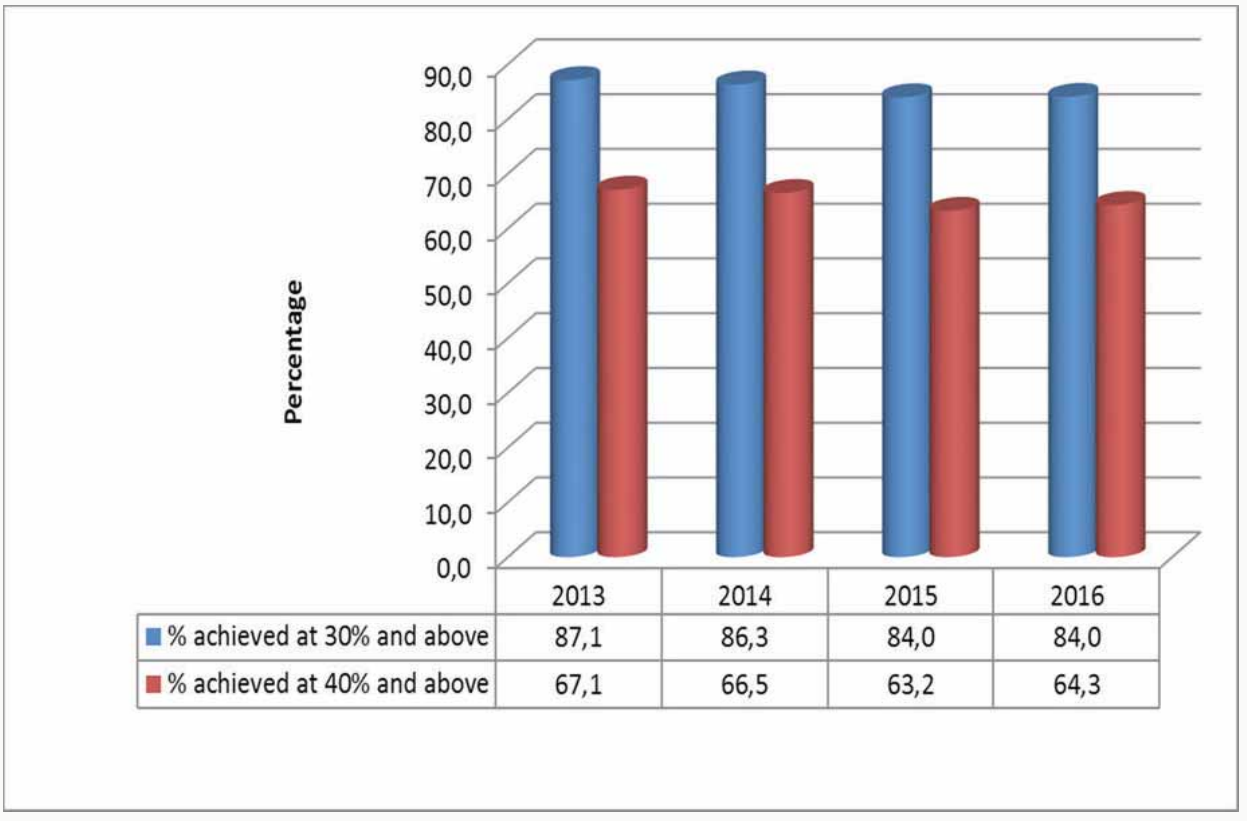
8.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates increased by 3 263 in comparison to that of 2015. The general performance of candidates improved this year as indicated by 84,0% of candidates achieving 30% and above, with 64,3% achieving 40% and above.

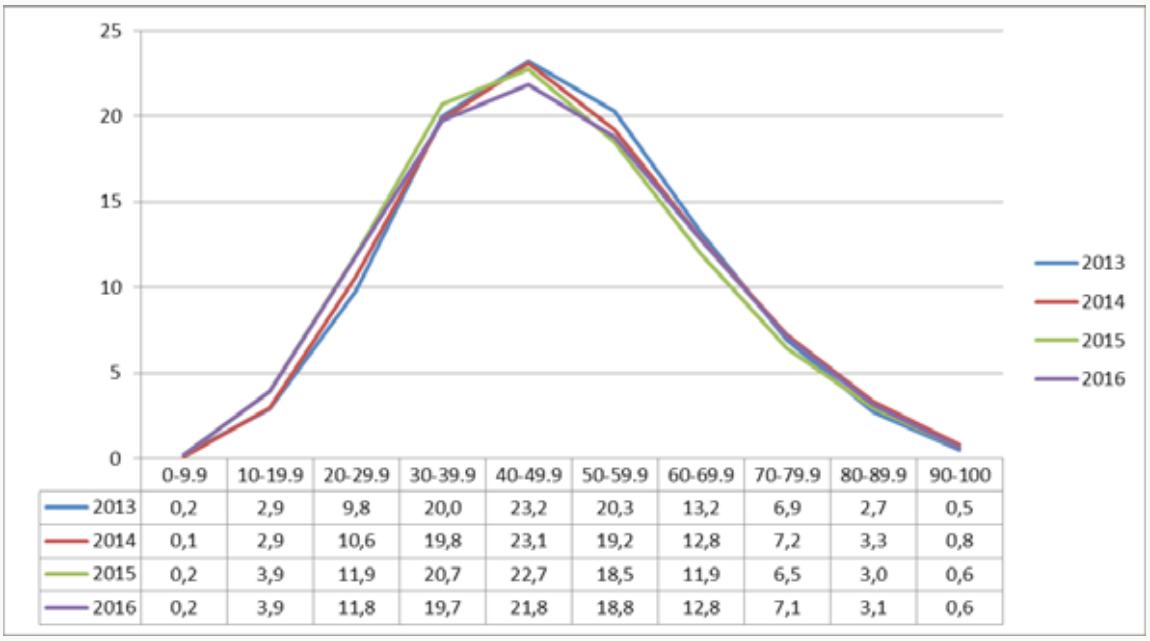
Table 8.1.1 Overall achievement in History

Year	No Wrote	No. achieved at 30% and above	% achieved at 30% and above	No. achieved at 40% and above	% achieved at 40% and above
2013	109 046	94 982	87,1	73 136	67,1
2014	115 686	99 823	86,3	76 904	66,5
2015	154 398	129 643	84,0	97 646	63,2
2016	157 594	132 457	84,0	101 347	64,3

Graph 8.1.1 Overall achievement in History



Graph 8.1.2 Performance distribution curves in History



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0,2	2,9	9,8	20,0	23,2	20,3	13,2	6,9	2,7	0,5
2014	0,1	2,9	10,6	19,8	23,1	19,2	12,8	7,2	3,3	0,8
2015	0,2	3,9	11,9	20,7	22,7	18,5	11,9	6,5	3,0	0,6
2016	0,2	3,9	11,8	19,7	21,8	18,8	12,8	7,1	3,1	0,6

From the above graphs, it is evident that there was a slight improvement in the performance of candidates in 2016.

8.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

(a) Candidates' performance in this question paper ranged from poor to good. Lack of content knowledge was a common problem.

(b) Candidates were generally weak at writing paragraphs and in addressing questions involving comparisons, reliability, usefulness and validity. They also tended not to recognise visual clues in the cartoons as required by various questions.

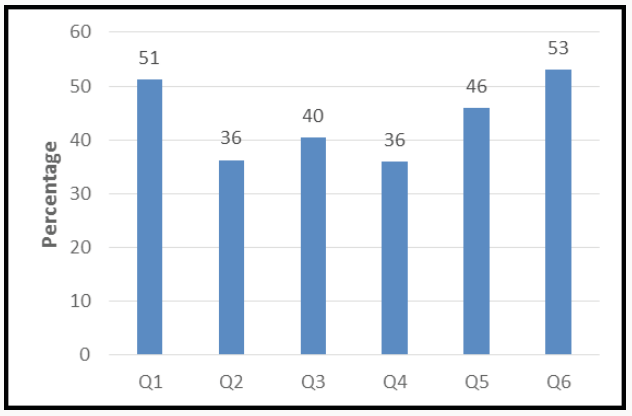
(c) There was a general improvement in essay-writing this year as most candidates could complete a comprehensive essay. Weaker candidates, however, failed to provide properly structured essays with effective introductions and conclusions.

(d) Many candidates appeared to understand the content of the essays but could not provide a relevant introduction and conclusion; nor could they take a stance and defend it with a relevant line of argument.

8.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

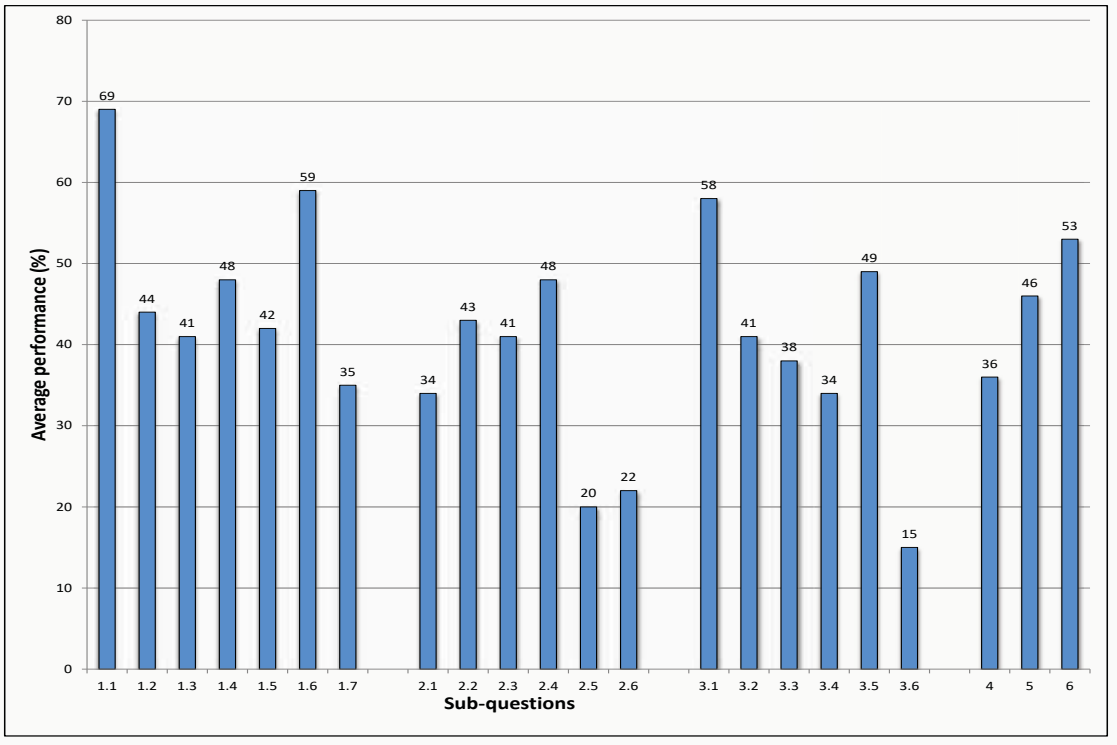
The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates. The sample of candidates performed best in Q1 of the source-based questions and in Q6 of the essay questions.

Figure 8.3.1: Average marks per question expressed as a percentage: Paper 1



Q1	The Cold War: The Origins of the Cold War
Q2	Independent Africa: Case Study – Angola
Q3	Civil Society Protests from the 1950s to the 1970s: the Civil Rights Movement
Q4	Extension of the Cold War: Case Study – Vietnam
Q5	Independent Africa: Comparative Case Study – The Congo and Tanzania
Q6	Civil Society Protests from the 1950s to the 1970s: the Black Power Movement

Figure 8.3.2: Average marks per sub-question expressed as a percentage – Paper 1



8.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

SECTION A: SOURCE-BASED QUESTIONS

QUESTION 1: THE COLD WAR: THE ORIGINS OF THE COLD WAR

This was a very popular question and was answered by many candidates. Generally, candidates' performance ranged from fair to good.

Common errors and misconceptions

(a) In Q1.2.3, many candidates could not explain the historical concept, '*monopoly capital*' in the context of the Cold War.

(b) In Q1.3, candidates were unable to explain which ONE of the sources (1A or 1B) would be more useful to a historian studying the implementation of the Marshall Plan. Candidates tended to focus on the general concept of usefulness and ignored the rest of the question.

(c) In Q1.5, some candidates did not recognize that these sources were from a Soviet perspective and thus presented the USA as giving financial aid in a negative light. They discussed the Marshall Plan from the USA's point of view and yet the question instructed the learners to discuss the communist view.

(d) In Q1.7, some candidates could not give reasons why the USA gave financial aid to European countries. Candidates displayed poor content knowledge and did not focus on the topic. Some candidates lacked the skills of extraction, interpretation, analysis and synthesis.

QUESTION 2: INDEPENDENT AFRICA: CASE STUDY – ANGOLA

Common errors and misconceptions

(a) In Q2.1.3, many candidates could not explain the historical concept, '*propaganda*' in the context of the Battle of Cuito Cuanavale.

(b) In Q2.2.2, candidates were not able to take a stance in answering questions such as 'Using the information in the source and your own knowledge, explain to what extent you agree with Castro's statement, "In Cuito Cuanavale the South African army really broke their teeth".'

(c) Q2.5 posed a challenge in that candidates were not able to draw a comparison between the two sources regarding the role that the United States of America played in the resolution of the crisis in southern Africa in the late 1980s.

(d) In answering Q2.7, many candidates could not explain the consequences for South Africa of the Battle of Cuito Cuanavale, because they lacked the skill to write a paragraph using relevant sources and their own knowledge.

QUESTION 3: CIVIL SOCIETY PROTESTS FROM THE 1950S TO THE 1970S: THE CIVIL RIGHTS MOVEMENT

This was a very popular theme and was answered by most candidates. This question was, however, answered only moderately well.

Common errors and misconceptions

(a) Candidates struggled to define the concept of *integration* in Q3.1.2 within the context of school desegregation.

(b) In Q3.3.1, it was evident that some candidates could not address the question regarding the messages in the photograph.

(c) In Q3.2.4 many candidates did not respond on the usefulness of the source to a historian researching the 'choices' that people made regarding the integration at Central High School. They responded to usefulness in general.

(d) Q3.4 was poorly answered, because many candidates were unable to compare the two sources and explain how they support each other regarding the challenges that the students at Central High School faced.

(e) The paragraph in Q3.6 was fairly answered, although many candidates displayed poor content knowledge and a lack in paragraph-writing skills.

SECTION B: ESSAY QUESTIONS

QUESTION 4: EXTENSION OF THE COLD WAR: CASE STUDY – VIETNAM

This was a very popular essay. However, candidates struggled to answer the question by taking a line of argument and developing it with relevant historical evidence.

Common errors and misconceptions

(a) Some candidates gave unnecessary background information about Vietnam before the 1960s.

(b) The majority of candidates are still unable to sustain their line of argument throughout the essay and relate their arguments clearly to their conclusion.

(c) The majority of candidates wrote a narrative essay on the United States of America's containing communism in Vietnam, without explaining to what extent the tactics and strategies that the Viet Cong used against the American army were successful in containing the spread of capitalism in Vietnam between 1965 and 1975.

(d) Some candidates showed a lack of adequate content knowledge.

QUESTION 5: INDEPENDENT AFRICA: COMPARATIVE CASE STUDIES - THE CONGO AND TANZANIA

This question posed a challenge because candidates were expected to evaluate the differences and similarities in leadership between Mobutu Sese Seko and Julius Nyerere in transforming the political and economic policies of their countries during the 1960s and 1970s. The question is higher-order and requires interpretation and analysis for which most candidates lacked the required skills.

Common errors and misconceptions:

(a) Some candidates did not sustain their line of argument throughout the essay.

(b) Some candidates did not reflect a balance between the two countries. Too much emphasis was placed on one country only.

QUESTION 6: CIVIL SOCIETY PROTESTS FROM THE 1950S TO THE 1970S: THE BLACK POWER MOVEMENT

This question was answered by most candidates. They seem to have mastered this theme thoroughly. However, weaker candidates appeared not to have been exposed to it in class.

Common errors and misconceptions

(a) Some candidates did not adopt a stance or line of argument in explaining, for example, the extent to which the Black Power Movement was successful in instilling 'Black Pride' among African Americans in the 1960s.

(b) Many candidates found it difficult to construct a relevant introduction and conclusion.

(c) Some of the candidates scored very low marks in this question because they focused on irrelevant issues such as the life histories of Malcolm X and Stockely Carmichael.

OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

(a) Candidates' performances in this question paper generally ranged from fair to good.

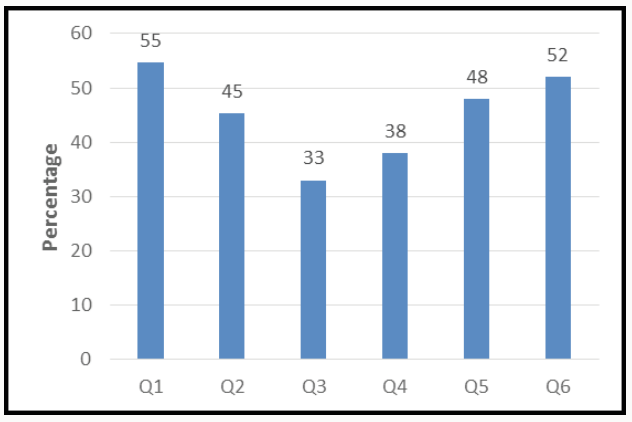
(b) Source-based questions were satisfactorily answered; however, candidates were generally weak at answering the paragraph-type questions.

(c) In the essay questions, candidate's performances ranged from poor to good. Underperforming candidates were unable to address the demands of the question posed. Most essays lacked content, structure and a relevant line of argument. Many candidates responded satisfactorily to Question 5 and poorly to Question 4.

8.5. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

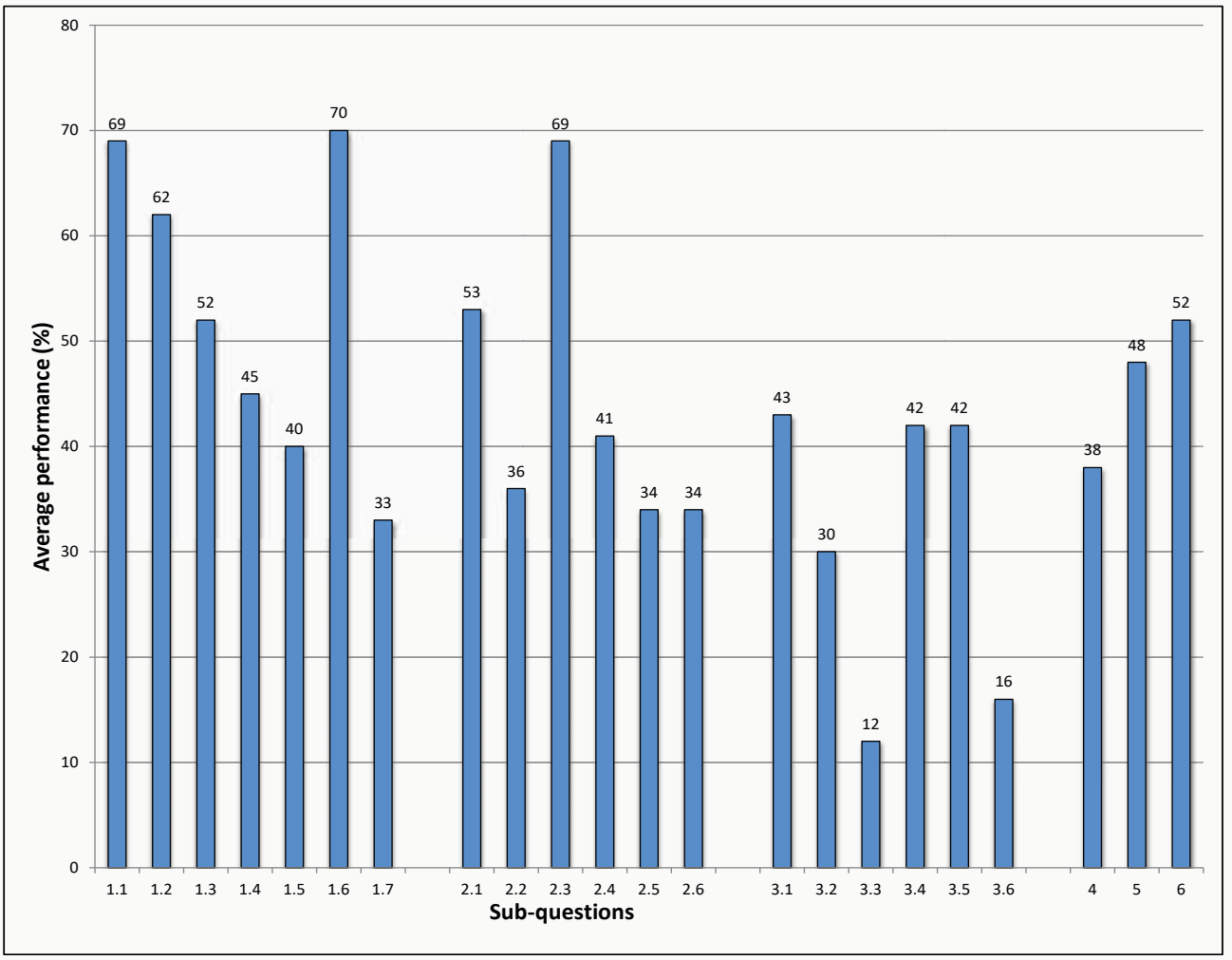
The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates. The graph shows that Q1 was the best-answered source-based question and Q6 was best-answered of the essay questions.

Figure 8.6.1: Average marks per question expressed as a percentage: Paper 2



Q1	Civil Resistance, 1970s to 1980s: South Africa
Q2	The coming of democracy to South Africa and coming to terms with the past
Q3	The end of the Cold War and a New World Order, 1989 to the present
Q4	Civil Resistance, 1970s to 1980s: South Africa: The crisis of apartheid in the 1980s
Q5	The coming of democracy to South Africa and coming to terms with the past
Q6	The end of the Cold War and a New World Order: The events of 1989

Figure 8.6.2: Average marks per sub-question expressed as a percentage for Paper 2



8.6. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

SECTION A: SOURCE BASED QUESTIONS

QUESTION 1: CIVIL RESISTANCE, 1970S TO 1980S: SOUTH AFRICA

Most candidates chose this question. It was generally well-answered.

Common errors and misconceptions

(a) In Q1.1.1, many candidates were unable to define the concept, *Black Consciousness*.

(b) In Q1.1.4, candidates were unable to comment on the roles that Seth Mazibuko and Tsietsi Mashinini played in mobilising the learners of Soweto.

(c) In Q1.3, candidates were unable to explain which ONE of the sources (1A or 1B) would be more useful to a historian.

(d) Many candidates were unable to compare sources and explain how they support each other regarding the Soweto uprising in Q1.5.

(e) In Q1.7, candidates were unable to use relevant evidence to write a coherent paragraph explaining how the philosophy of Black Consciousness influenced the Soweto Uprising of 1976.

QUESTION 2: THE COMING OF DEMOCRACY TO SOUTH AFRICA AND COMING TO TERMS WITH THE PAST

This question was very popular and was generally well answered.

Common errors and misconceptions

(a) In Q2.1.2, many candidates were unable to explain the concept *amnesty* in the context of the TRC hearings.

(b) In Q2.1.4, candidates were unable to compare evidence within a source and explain why Willem Coetzee and Nimrod Veyi's evidence contradicted each other regarding the disappearance of Nokuthula Simelane.

(c) In Q2.2.1, candidates were able to see the visual clues but were unable to use them to support their answer.

(d) In Q2.2.2, candidates were unable to offer their opinion as to why (a) Boipatong and (b) Niewoudt appeared in the cartoon.

(e) In Q2.4, many candidates were unable to compare sources and explain how they support each other regarding the disappearance of Nokuthula Simelane.

(f) In Q2.6, candidates were unable to write a cohesive paragraph explaining whether the TRC was successful in dealing with the injustices of the past. The question wanted candidates to take a stance and to defend this stance with relevant evidence from the sources. Most candidates remained indecisive in responding to this question.

QUESTION 3: THE END OF THE COLD WAR AND A NEW WORLD ORDER, 1989 TO THE PRESENT

Very few candidates selected this topic. However, candidates who opted for this question generally did well.

Common errors and misconceptions

(a) In Q3.1.3, candidates were unable to define the term, '*trade liberalisation'* in the context of globalisation.

(b) In Q3.2.3, candidates were unable to determine the usefulness of the source to a historian researching how structural adjustment programmes were imposed on developing countries.

(c) In Q3.6, candidates were unable to use relevant evidence to write a coherent paragraph explaining how the implementation of structural adjustment programmes by international financial institutions affected African countries

SECTION B: ESSAY QUESTIONS

QUESTION 4: CIVIL RESISTANCE, 1970S TO 1980S: SOUTH AFRICA – THE CRISIS OF APARTHEID IN THE 1980S

This question was answered satisfactorily.

Common errors and misconceptions

(a) Many candidates could not show how resistance led to the demise of 'grand' apartheid.

(b) Candidates were not able to sustain a coherent argument on how PW Botha's reforms were challenged by community organisations.

(c) Many candidates provided content without supporting it with a line of argument.

QUESTION 5: THE COMING OF DEMOCRACY TO SOUTH AFRICA AND COMING TO TERMS WITH THE PAST

This was a very popular question and candidates' performances ranged from weak to very good.

Common errors and misconceptions

(a) Candidates could not critically discuss the violence that plagued South Africa in the early 1990s and that almost derailed the process of negotiations and the birth of a democratic and free South Africa, by referring to the role that leadership, negotiation and compromise played in South Africa's attainment of democracy in 1994.

(b) Many candidates were unable to develop and sustain a relevant line of argument on the question posed.

(c) Candidates simply wrote narrative essays and in most cases the chronological sequencing of historical evidence was problematic.

QUESTION 6: THE END OF THE COLD WAR AND A NEW WORLD ORDER: THE EVENTS OF 1989

Many candidates did not answer this question. Candidates' performance ranged from poor to satisfactory.

Common errors and misconceptions

(a) Very few candidates showed how the collapse of the Soviet Union in 1989 served as a major catalyst for the political transformation that occurred in South Africa.

(b) Those who performed poorly gave more information on what happened in the USSR than in South Africa.

(c) The common challenge discernible in the responses of the few candidates who answered this question is that they tended to focus excessively on the conditions in the USSR before Michael Gorbachev took over.

Suggestions for improvement in both Paper 1 and Paper 2

(a) Teachers need to ensure that they follow the newly released National Examination Guidelines (2017 – 2019) during the teaching and assessment of the prescribed sections. The Examination Guidelines are designed to provide clarity on the scope that needs to be taught, studied and assessed. Candidates need to be taught examination techniques.

(b) It is necessary to have a thorough knowledge of the content focus areas. The planning, preparation and teaching of History must be rigorous.

(c) Learners should be exposed to a variety of sources and the related source-based skills such as interpreting, analysing, evaluating, comparing, contrasting and ascertaining the limitations, usefulness and justification of such sources. Learners should be taught the relevant themes, using interactive, user-friendly teaching methodology and the relevant notes.

(d) Teachers should focus on concepts and definitions at every available opportunity.

(e) Greater emphasis should be placed on the teaching of paragraph-writing skills. Revision using question papers from previous years should focus on helping learners to link the key question and the selected sources to write coherent paragraphs. If sources were to be summarised with the key question in mind, then candidates would be half way into answering the paragraph question whose formulation would be directly influenced by the key question. Learners should follow the clue provided by the question verbs used in paragraph questions to identify and use information from sources. They need to refer to evidence from sources and indicate their own knowledge within the responses to paragraph questions.

(f) Techniques used in the construction of a coherent, well-planned and structured essay need serious attention. Teachers should use the 'PEEL' approach to help learners write meaningful paragraphs in an essay. Learners should be taught the correct approach to essay writing, focusing on all the elements of a good essay (structure, content and skills).

(g) Learners should be encouraged to always use the 5 'W's and the 'H' in all historical inquiry (WHY can be used to teach historical 'interpretation'; WHEN to teach historical periods; WHERE to teach historical places; WHO to teach about historical figures; WHAT to teach about historical context and HOW to teach historical development (analysis).

(h) Teachers should use a variety of historical sources (books, DVDs, the internet, etc.) to convey the prescribed content to learners.

(i) Assessment, both informal and formal, should be ongoing and must assess historical skills such as interpretation, analysis, evaluation and synthesis of evidence from the given sources. It is also advisable for the educator to go beyond the Programme of Assessment and give more assessment tasks.

(j) A detailed analysis of learners' results should be undertaken by teachers to identify common areas of concern/weakness. This should be done immediately after an assessment is given. After this is done, appropriate remediation measures should be put in place to assist learners to develop the skills necessary for historical analysis.

(k) Past and exemplar examination question papers should be made available and learners should be required to work with them. This would assist in refining examiners' questioning techniques.

(l) There should be interaction with the latest resource materials and teaching trends in History: e.g. listening to matric radio programmes; reading newspaper supplements. Schools that have produced outstanding results should network with those which have difficulties, i.e. the twinning of schools.

(m) Under-performing schools should be visited by the curriculum advisers on a regular basis so that the appropriate support and guidance may be given to teachers.

(n) Curriculum Advisers must plan, prepare and conduct intensive content and assessment workshops on problematic aspects of the Grade 12 curriculum with History educators.

(o) Curriculum Advisers must develop relevant resource materials with which both educators and learners can interact.

(p) SBA Clusters should practise the setting of test and examination question papers and have them moderated by curriculum advisers to ensure standardisation. Past NSC question papers must be used to benchmark the setting of questions for tests and examinations.

(q) The implementation of common controlled tests would lead to an improvement in the quality of teaching, learning and assessment.

(r) There should be rigorous monitoring of the History SBA tasks so that the quality of assessment items and the moderation thereof are not compromised.

(s) Teachers need to make use of the matrix and the levels rubric when assessing essay and paragraph questions respectively.

(t) In 2017 a new Examination Guideline will be used in the teaching and assessment of the Grade 12 History curriculum. In light of this, it is anticipated that the curriculum unit at the National Department of Basic Education will develop appropriate and relevant resources for further training and distribution to Curriculum Advisers and teachers throughout RSA.

CHAPTER 9. LIFE SCIENCES

The following report should be read in conjunction with the Life Sciences question papers of the November 2016 Examination.

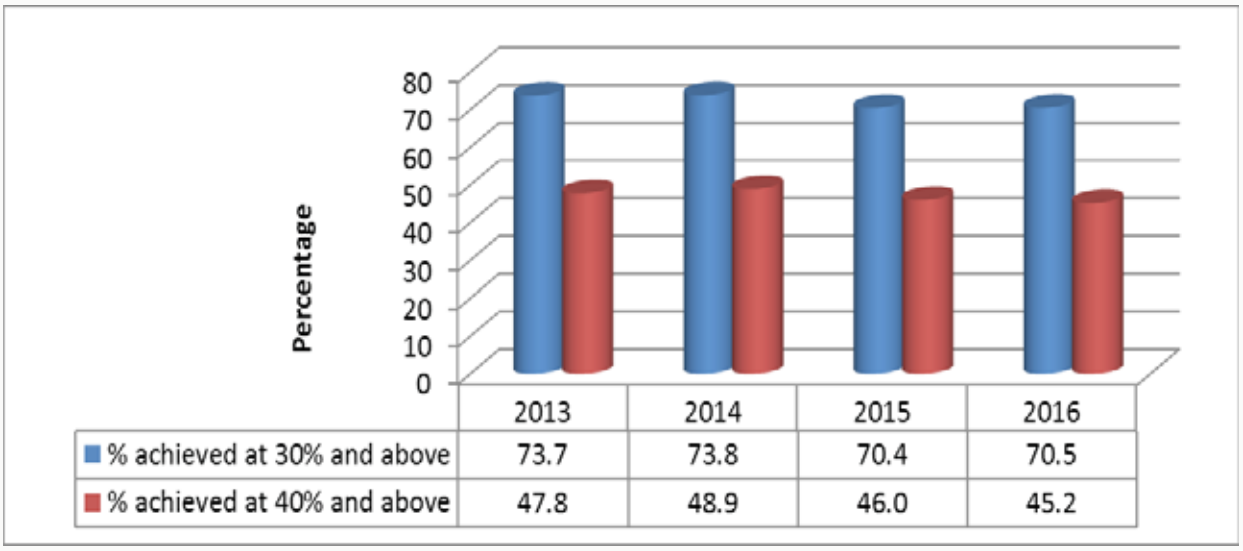
9.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates decreased by 414 this year in comparison to 2015. The general performance of candidates improvedmarginally this year as indicated by the 70,5% of the candidates achieving at 30% and above. However, the number of candidates achieving at 40% and above declinedby 0,8%.

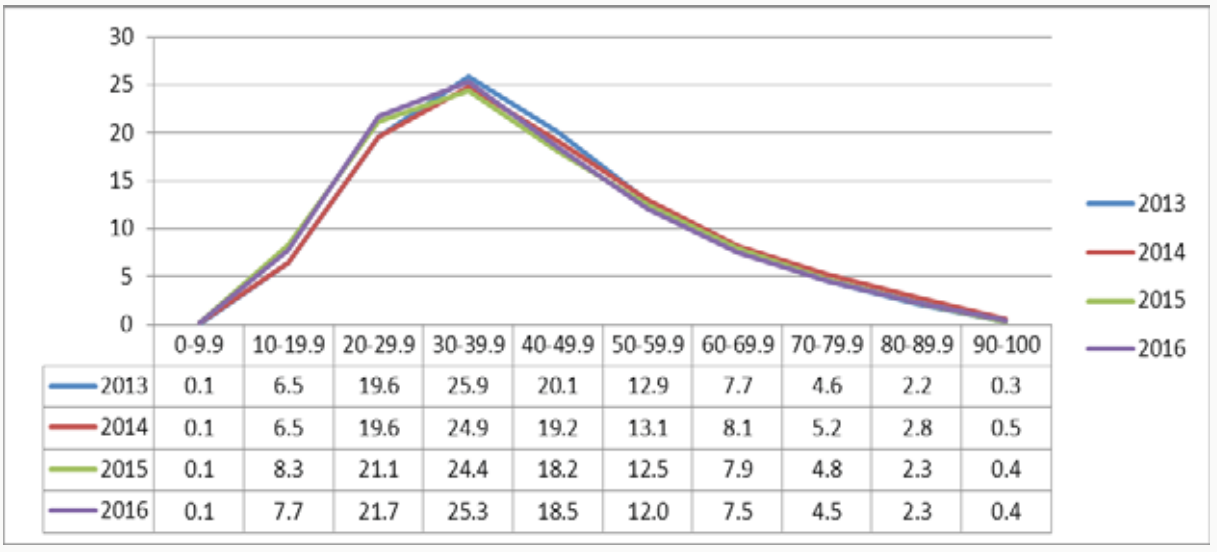
Table 9.1 Overall achievement rates in Life Sciences

Year	No Wrote	No. achieved at 30% and above	% achieved at 30% and above	No. achieved at 40% and above	% achieved at 40% and above
2013	301 718	222 374	73.7	144 355	47.8
2014	284 298	209 783	73.8	139 109	48.9
2015	348 076	245 164	70.4	160 204	46.0
2016	347 662	245 077	70.5	157 177	45.2

Graph 9.1.1 Overall achievement rates in Life Sciences



Graph 9.1.2 Performance Distribution Curves in Life Sciences



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.1	6.5	19.6	25.9	20.1	12.9	7.7	4.6	2.2	0.3
2014	0.1	6.5	19.6	24.9	19.2	13.1	8.1	5.2	2.8	0.5
2015	0.1	8.3	21.1	24.4	18.2	12.5	7.9	4.8	2.3	0.4
2016	0.1	7.7	21.7	25.3	18.5	12.0	7.5	4.5	2.3	0.4

From the above graphs, it is evident that the results have remained more or less constant over the past two years.

9.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

General comments

(a) Some candidates were not familiar with basic terminology in the different topics. This resulted in poor performances, even in the lower-order questions.

(b) Some candidates had problems distinguishing between action verbs such as state, suggest, describe and explain.

(c) Certain problem areas mentioned in previous reports e.g. investigations which form part of the work throughout the year, remain a challenge to some candidates.

(d) Learners must follow the instructions and start each question on a new page.

(e) The handwriting of some learners is illegible.

(f) Candidates' performance indicates that the questions on environmental studies which were taught in Grade 11 was not revised properly or covered again in Grade 12.

(g) Since textbooksdo not always carry accurate information, teachers should always be guided by the CAPS and Examination Guidelinedocuments for the Life Sciences.

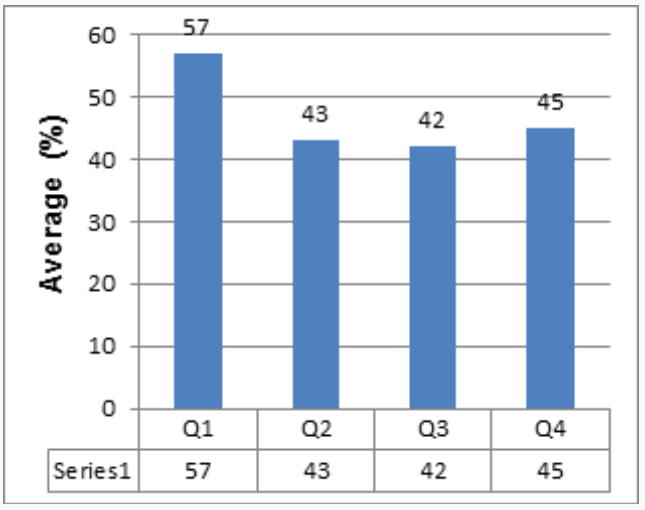
(h) Candidates generally performed better in Q1 when compared to the marks they acquired in the rest of the paper.

(i) Although some candidates performed well and obtained high scores in the essay, many candidates could not identify the aspects that were required and wrote on everything, losing marks for the synthesis.

9.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

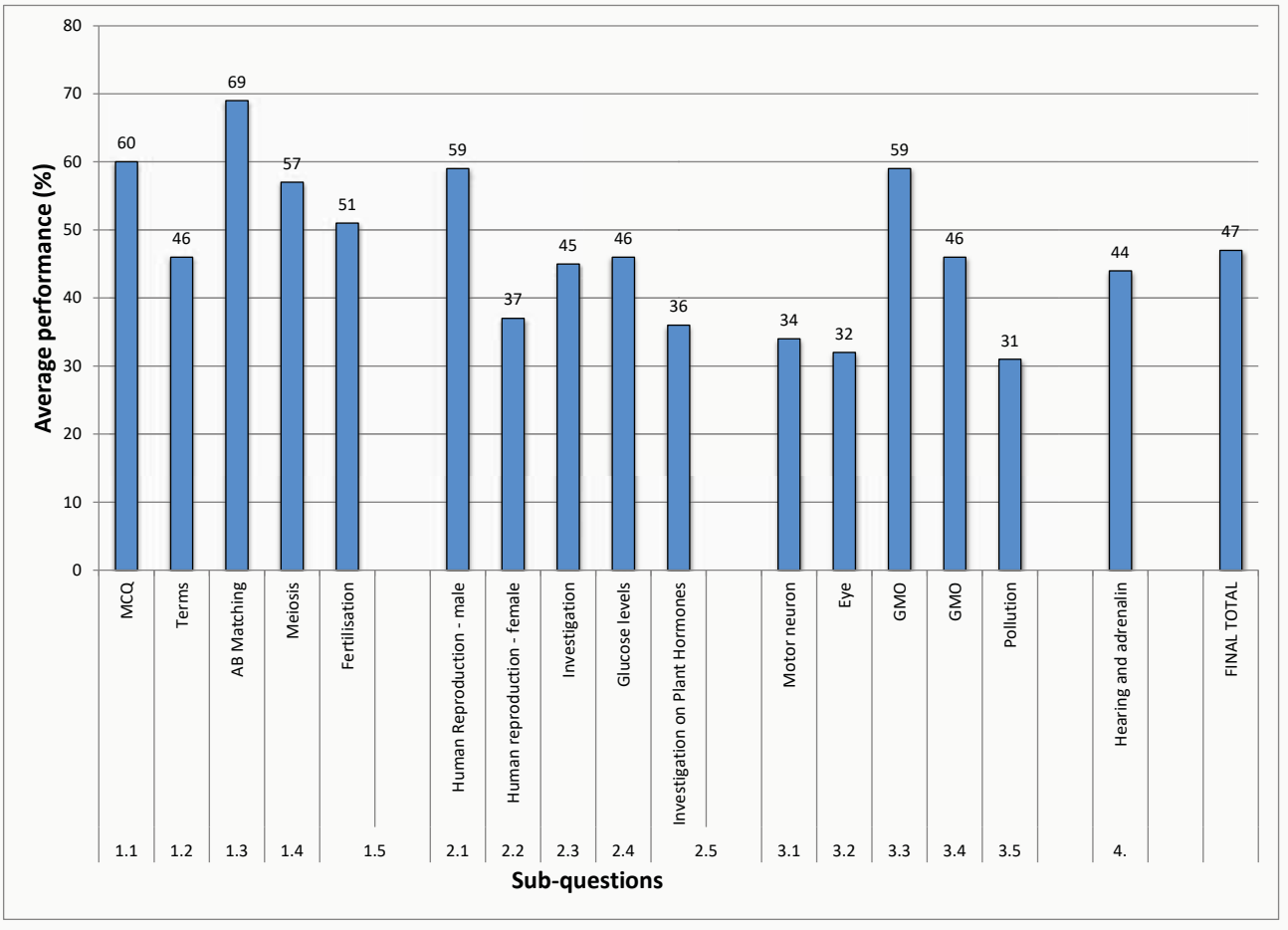
The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Graph 9.3.1 Average marks per question expressed as a percentage: Paper 1



Q1	Multiple Choice, Terminology, Matching, Meiosis and Fertilisation
Q2	Human Reproduction,Scientific investigation on Temperature and Pulse rate, Glucose level and Investigation on Auxin
Q3	Neuron, Visual defect, GMO, Human Impact (gasohol) and Thermal Pollution
Q4	Hearing and the role of Adrenalin on muscles

Graph 9.3.2 Average marks per sub question: Paper 1



The worst performance by candidates was recorded in the sub-questions on thermal pollution,visual defect of the eye, the functioning of the neuron, the investigation on auxins, andfemale hormones.

9.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

QUESTION 1: MULTIPLE CHOICE,TERMINOLOGY, MATCHING, MEIOSIS AND THE HUMAN OVUM

Common errors and misconceptions

(a) Poor performance in Q1.1 showed that candidates lacked basic knowledge of terminology. Candidates lost marks since they were unable to:

- Correctly identify the cerebellum as the structure that receives nerve impulses from the semi-circular canals.
- Identify thatretina is responsible for the conversion of a light stimulus to a nerve impulse.
- Differentiate betweennumber of autosomes and gonosomes in the human body.
- Correctly identify the planning steps before and during an investigation.

(b) InQ1.2, biological terms remain problematic for many candidates. Some candidates did not use the correct scientific names but used common names instead. In Q1.2.2, candidates wrote '*automatic'* instead of '*autonomic'* nervous system. In Q1.2.7, candidates mistakenly wrote *uterine wall* instead of the *endometrium*, while the question clearly asked for the *inner lining of the uterus.*

(c) In Q1.3, candidates did not follow the instructions when answers were given. For example, they wrote *A+B* or *A,B* and sometimes *A/B* instead of *both A and B*. In Q1.3.1 candidates werenot able to differentiate between *vivipary* and *ovovivipary.*

(d) Many candidates lost marks inQ1.4 because theycould not identify the different phases of meiosis I and meiosis II in the correct sequence. Also,the skill of determining the number of chromosomes before and after meiosis posed a problem. In Q1.4.1(b), where the answer 'centriole' was required candidates provided the word 'pole' instead.

(e) In Q1.5,the structure of the ovum was not well known by many candidates.

Suggestions for improvement

(a) There needs to be a greater emphasis on the learning of appropriate terminology related to the various topics, together with the correct spelling of these terms. Teachers should use the following strategies to improve the teaching of terminology:

- Identify new terms in every lesson and write them on the board.
- Instruct learners to take down terms at the back of their notebooks, noting the

correct spelling.

- Encourage learners to write down the meanings of these words, as ascertained by being attentive during the lesson or by finding the meaning in a dictionary or textbook.
- Break down the term where possible, giving the meanings of prefixes, suffixes andother components: for example, inter = between and therefore interphase refers to the phase *between* two successive divisions of the cell.
- Make learners aware of the meanings of new terms by using them in sentences.
- Include biological terms in all daily assessment tasks.
- Ensure that by the end of the year, all learners have a comprehensive glossary of all terms.

(b) Learners must follow the instructions as prescribed in Q1.3. Answers should be written as *A only* (not A), *B only* (not B), *both A and B* (not A + B; A,B; A and B or A/B). Teachers should enforce this in all assessment activities done at school.

(c) The events of the different phases of meiosis should be taught using annotated diagrams to clearly show what happens during each phase. The effects of crossing over should be followed through the different phases using the shading of chromosomes.

(d) Learners should be given sufficient practice at understanding the instructions as contained in questions. Some questions prescribe that a LETTER is required, whereas at other times a LETTER and NAME may be required.

(e) Teachersshould give learners multiple opportunities to label drawings and write in the functions next to the labels. Refer to the blank diagrams found in the *Mind the Gap*study guide.

(f) Teachers must adhere to the Examination Guidelines and not depend on textbooks alone to prepare learners for the examination. The diagram of a human ovum tested in Q1.5. is,for example, not included in several textbooks.

(g) Use a range of textbooks when preparing for the teaching of a section so that learners can be informed of alternative words.

QUESTION 2:
HUMAN REPRODUCTION, SCIENTIFIC INVESTIGATION ON HOMEOSTASIS AND PLANT HORMONES

Common errors and misconceptions

(a) In Q2.1, some candidates have a misconception that the testis should be at a temperature 2 to 3 ºC instead of 2 to 3 ºC *below body temperature*. In Q2.1.3, some candidates lost marks by only naming the consequence without linking it with either temperature or pressure (the path) or naming the effect.

(b) In Q2.2, which required the interpretation of a graph on the use of a fertility monitor that measured the concentration of oestrogen and LH, many candidates lost marks because they:

- Could not interpret the graph in Q2.2.2 and just gave functions of the hormones without linking them to the information required.
- Discussed in Q2.2.6 *the role of progesterone in relation to maintaining pregnancy* while the whole question was based on determining the *fertile period*.
- Were able to provide the CAUSE but not the EFFECT and therefore lost marks.
- Repeated the question which indicated that somecandidates struggled to formulate answers. Some candidates confused *fertility* with *fertilisation*.

(c) In Q2.3,candidates repeated the words in the question paper to answer questions. They only read part of the question and then only answered that part. They only provided a response to the effect of vasoconstriction and not the effect of metabolism. Many candidates did not know what metabolism is.

(d) Some candidates still confuse dependent and independent variables and could not state the factors that were kept constant during the investigation.

(e) In Q2.4,some candidates still use *glucagon* and *glycogen* interchangeably.

(f) In Q2.5, many candidateshad no knowledge on apical dominance and the role of auxins in apical dominance.

Suggestions for improvement

(a) Give learners more practice in questions that need an explanation.

(b) Use graphs to explain the role of the female hormones and link this knowledge with everyday life scenarios e.g. fertility monitor. Teachers must explain the difference between *hormones* and *glands*.

(c) Teachers should expose learners to the different steps of the scientific method andensure that learners understand the concept of metabolism with all the processes involved e.g. cellular respiration and heat regulation.

(d) Further to the above,learners should be clearly shown how to answer a question asking for a *description* of the effect of caffeineand how this would be different from a question requiring an *explanation*for the effect of caffeine on temperature change.A description requires a statement of the changes of the effect of caffeine on body temperature whereas an explanation has to includea *reason* for the effect on temperature. The term explain, refers to *cause* and *effect* in context.

(e) Teachers should ensure that the topic on plant growth substances is taught thoroughly and that the prescribed practical work is done, so that learners have a good understanding of this topic.

QUESTION 3:
NEURON, VISUAL DEFECT IN THE HUMAN EYE AND HUMAN IMPACT ON THE ENVIROMENT

Common errors and misconceptions

(a) Some candidates were not able to write the function of the axon in Q 3.1.3 but gave general functions of the neuron instead.

(b) In Q3.2,candidates lost marks because they:

- Confused the *choroid* with the *chorion*
- Showed little understanding of long-sightedness and lackedthe appropriate terminology to answer the questions.
- Could not link the *structure* of the lens with its specific *function*. Some explained accommodation in the eye instead and others only gave the function without linking it to the structure.

(c) In Q3.3.2,candidates confused *consumer* with *customer*.

(d) In Q3.4.3, candidates provided answers by using quotes from the passage only. They did not read the extract with understanding. Q 3.4.4 waspoorly answered since learners explained why it is better not to use gasohol in countries with warmer climates rather than why it was better to use it in colder climates, as instructed in the question.

(e) In Q3.5, candidates lost marks because they did not specify the impact that thermal pollution has on both the quality of water and biodiversity.

Suggestions for improvement

(a) Teachers should place greater emphasis on the teaching of the different parts of the organs (eye, neuron, etc.) and teach the *structure* and *function* of these organs using models and drawings.

(b) *State*, *describe* and *explain* are action words that need to be explained to learners.

Emphasise the cause and effect sequence, for example: *Cause*: organisms die,

Effect: it will reduce biodiversity.

(c) Teachers should provide multiple opportunities for learners to interpret textual and other information. Special attention should be given to strategies that would assist learners in identifying the key information in the text to be used as clues in the answering of the questions.

(d) There must be a greater emphasis on the teaching and learning of appropriate terminology related to the various topics, together with the correct spelling of these terms, for example, the definition of food security.

(e) Learners should be advised that two marks are generally allocated to each structural suitability, one mark for the part/structure and the second mark for the way it is suited to perform its function, e.g. the lens is elastic✓- *structure* and therefore it can change shape✓/convexity – *function*.

(f) Teachers should ensure that the section on Human Impact is properly taught and assessed inGrade 11 and should be thoroughly revised in Grade 12. Learners should have greater exposure to questions based on information from extracts as these will better prepare them to answer questions based on Human Impact on the environment.

QUESTION 4:
HEARING AND THE ROLE OF ADRENALIN ON THE FUNCTIONING OF MUSCLES TO ASSIST A PERSON IN DANGER

Common errors and misconceptions

(a) Many candidates did not interpret the essay question appropriately and therefore did not identify the two aspects required by the question, namely:

- The pathway for hearing sound.
- The role of adrenalin on the functioning of the muscles to enable a person to run away from danger.

As a result of the above, many candidates did not address one or both of the aspects required by the question and were therefore not awarded the synthesis mark for comprehensiveness.

(b) Many candidates stated the path of a sound wave instead of describing it.

(c) Many candidates gave irrelevant information, for example a description of the semi-circular canals which is involved in balance rather than hearing.

(d) Many candidates are confused about sound, sound waves; vibrations, pressure waves and mechanical waves.

Suggestions for improvement

(a) Teachers should offer more opportunities for learners to write answers in essay-form. Teachers should informlearnersthat the essay in Life Sciences does not require an introduction and a conclusion.

(b) Teachers should use, as examples, the current and past examination essay questions to deliberately teach learners the skill of interpreting the question to determine what is required. Key words in the question should be underlined.

(c) Teachers must make use of *Mind the Gap*study guideto explain to learners howmind maps may be used in the planning of an essay.

(d) Learners should be reminded that synthesis is made up of three parts: relevance, logical sequence and a comprehensive answer. The allocation of the synthesis marks should be explained to them and used from grades 10 to 12. The synthesis mark for the essay in Q4 was applied as follows:

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been sufficiently addressed
In this essay in Q4	All the information provided is relevant to hearing and how adrenalin ensures that muscles function efficiently. There is no irrelevant information.	All the information provided on hearing and how adrenalin ensures that muscles function efficiently, is arranged in a logical manner.	At least the following marks should be obtained: - Hearing (7/10) - How adrenalin ensures that muscles function efficiently (4/7)
Mark	1	1	1

(e) Subject advisors should train teachers on the application of the criteria for synthesis. This can be done by giving different teachers the same sample script to mark and to which synthesis marks are allocated. This should be followed by a discussion with reasons on whether the answer in the sample script should be awarded a mark for each aspect of synthesis.

9.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

General comments

(a) Essay writing was very poor. Many candidates still lack the skill of constructing a good essay.

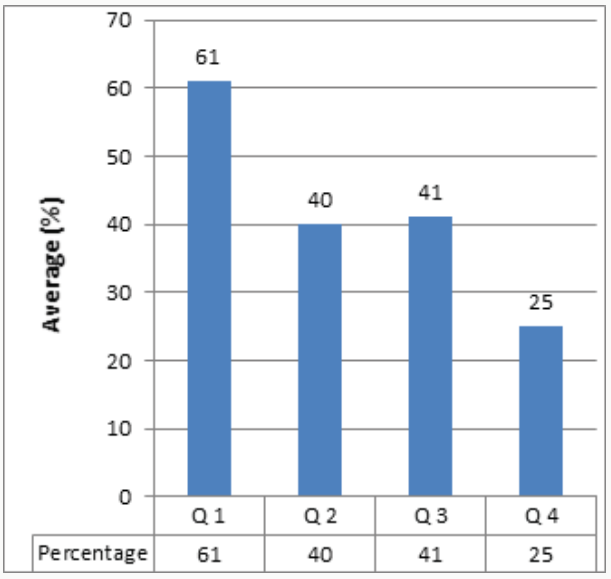
(b) Many candidates were not familiar with basic terminology in the different topics. This resulted in poor performance even in lower-order questions.

(c) Poor performance was recorded in questions based on scientific investigations and hypothesis testing.

9.6. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

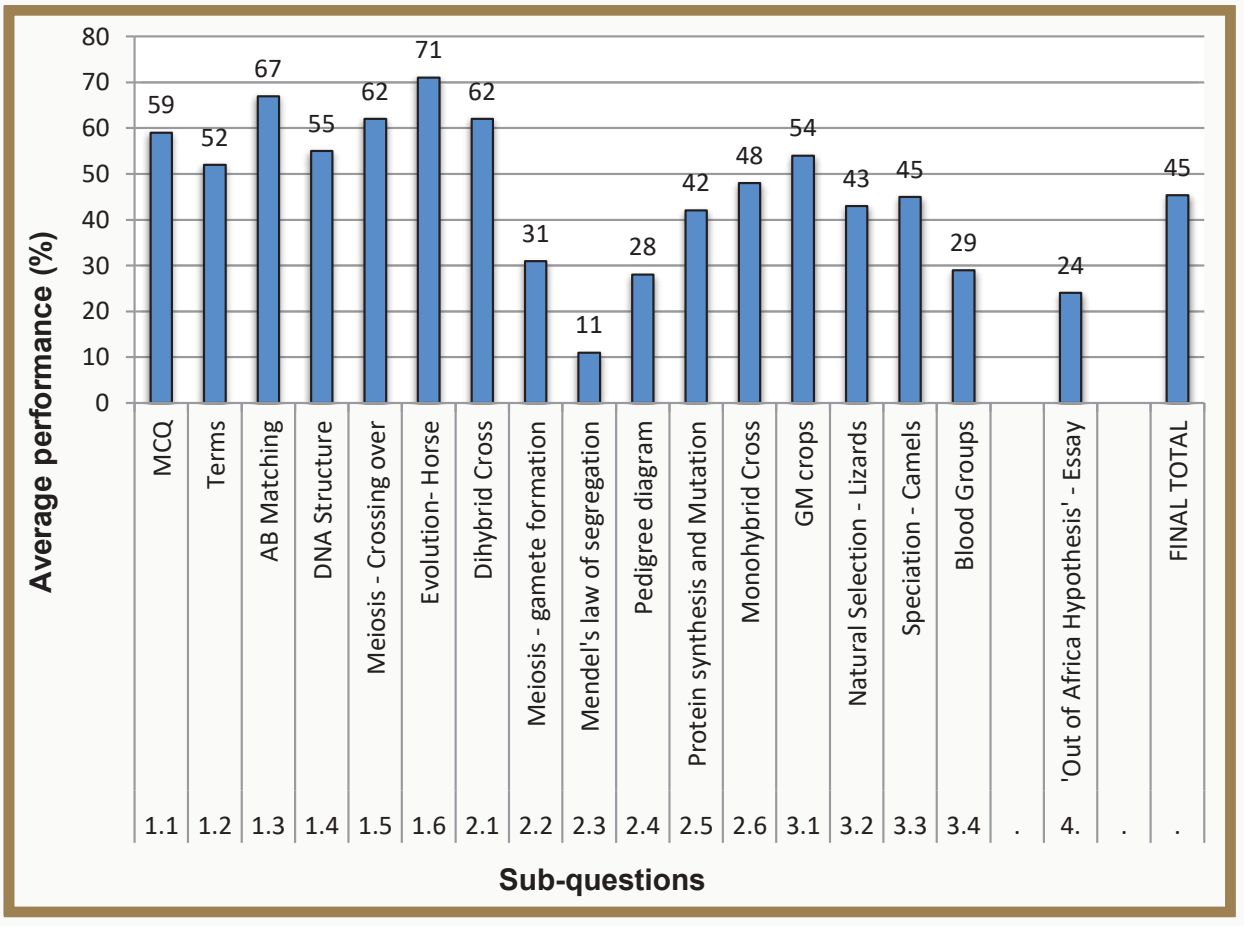
The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Graph 9.6.1 Average marks per question expressed as a percentage: Paper 2



Q1	Multiple choice, Terminology, Matching, DNA molecule, Meiosis and Evolution of the Horse
Q2	Protein Synthesis, Meiosis and Genetics (dihybrid and monohybrid crosses)
Q3	Evolution (natural selection and speciation), Genetics, Scientific Investigation
Q4	'Out of Africa' hypothesis

Graph 9.6.2 Average performance per sub-question: Paper 2



The worst performance by candidates was in Q2 on Mendel's law of segregation, meiosis, pedigree diagram and protein synthesis, and in Q3 on natural selection and blood groups. In Q4, the essay on the 'Out of Africa' hypothesis was very poorly answered by most candidates.

9.7. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

QUESTION 1:
MULTIPLE CHOICE, TERMINOLOGY, MATCHING, DNA STRUCTURE, MEIOSIS AND DATA RESPONSE ON EVOLUTION

Common errors and misconceptions

(a) Performance in Q1.1 showed that candidates lacked basic knowledge of terminology.

(b) Q1.2 on biological terminology once again posed a great challenge to many candidates. This poor understanding of basic terminology and concepts has an adverse effect on their interpretation of and responses to questions. Terms such as *peptide bond*, *non-disjunction* and *hypothesis* seemed not to have been known by many candidates.

(c) Candidates did not follow the instructions as prescribed in Q1.3 requiring answers to be written as A *only*, B *only*, both A and B or none.

(d) In Q1.4, candidates performed poorly since they were not able to identify that a nucleotide is made up of 3 components, viz. a sugar, a phosphate group and a nitrogenous base. Also, candidates did not use the information provided in the diagram to give the correct label for 1 (adenine), but rather gave a generic answer – nitrogenous base.

Suggestions for improvement

(a) There needs to be a greater emphasis on the learning of appropriate terminology related to the various topics, together with the correct spelling of these terms. Teachers should use the following strategies to improve the teaching of terminology:

- Identify new terms in every lesson and write them on the board.
- Instruct learners to take down terms at the back of their notebooks, noting the correct spelling.
- Encourage learners to write down the meanings of these words, as ascertained by being attentive during the lesson or by finding the meaning in a dictionary or textbook.
- Break down the term where possible, giving the meanings of prefixes, suffixes and other components: for example, inter = between and therefore interphase refers to the phase *between* two successive divisions of the cell.
- Make learners aware of the meanings of new terms by using them in sentences.
- Include biological terms in all daily assessment tasks.
- Ensure that by the end of the year, all learners have a comprehensive glossary of all terms.

(b) Teachers should also highlight the differences between different concepts, e.g. *homologous/ homozygous, DNA profiling/fingerprinting, dipeptide/polypeptide/peptide bond, theory/hypothesis, codons/anticodons, transcription/translation, genotype/phenotype and chromatid/daughter chromosome/chromosome.*

(c) Learners must follow the instructions as prescribed in Q1.3. Answers should be written as *A only* (not A), *B only* (not B), *both A and B* (not A + B; A, B; A and B or A/B) or *none*. Teachers should enforce this in all classroom assessment activities.

(d) Teachers should give learners multiple opportunities to answer questions based on data provided. Guidance should be provided to learners on how to read/interpret the data given so as to use the clues provided in answering the questions set.

QUESTION 2:
PROTEIN SYNTHESIS, GENETICS, MEIOSIS AND NUCLEIC ACIDS

Common errors and misconceptions

(a) The majority of the candidates were not able to draw and label the diagram required in Q2.2.3. These candidates were not able to apply their knowledge of meiosis to identify that they had to draw a gamete representing telophase II.

(b) The majority of the candidates were not able to state Mendel's law of Segregation. In fact, Q2.3 was the most poorly answered question in Paper 2.

(c) In Q2.4, many candidates incorrectly assumed that Huntington's chorea is a sex- linked disorder. Consequently, they wrote Sarah's genotype as X^hX^h. Many candidates also incorrectly as sumed that the genetic disorder is caused by a recessive allele. Many candidates could not differen tiate between *explain* and *describe* and consequently lost marks in Q2.4.3.

(d) Q2.5 on protein synthesis was poorly answered by many candidates for the following reasons:

- Inability to identify that the diagram represented *transcription*, and not *translation*, in spite of the fact that a DNA molecule was drawn and an mRNA strand was formed.
- Inability to recognise that the table given in the question referred to mRNA codons coding for specific amino acids. They needed to convert the DNA triplet of bases (CAG) to the mRNA codon (GUC) before they could read off from the table.
- Difficulty in explaining how a mutation could result in the formation of a different protein.

(e) Many candidates experienced difficulty in solving the monohybrid cross on incomplete dominance. Also, many candidates failed to get the 2 easy marks for simply writing the correct format for a monohybrid cross.

Suggestions for improvement

(a) Teachers should provide learners with multiple opportunities to label diagrams of different phases of meiosis. Blank diagrams provided in the *Mind the Gap* study guide can be used for this purpose. Teachers should not only teach the process of meiosis well, but also teach the process so that candidates could apply their knowledge to questions such as asked in Q2.2.3. Candidates had to first recognize the phase represented in the diagram given (metaphase I) and then represent how a cell at telophase IIwould appear.

(b) Teachers should briefly refer to Mendel's experiments with pea plants as an introduction to Genetics. In addition, an explanation of how his experiments translate to the modern-day understanding of his Law of Segregation must be thoroughly explained to candidates as follows: 'The pair of alleles on homologous chromosomes separate during meiosis, so that only one allele of each pair is found in each gamete'.

(c) Learners must not assume that a genetic disorder is sex-linked if this is not explicitly stated or implied in the question. Teachers should also give learners many examples of pedigree diagrams involving genetic disorders to eliminate the idea that all genetic disorders are sex-linked.

(d) Teachers should also expose learners to more questions on the interpretation of pedigree diagrams. Teachers can expose candidates to interpretation of pedigree diagrams by using the many questions available in previous national examination question papers.

(e) When learners are asked to explain something, they need to say HOW something works and to state a cause-effect sequence. In Q2.4.3, candidates needed to explain what the father's genotype needed to be so that there is a 50% chance of a child not having Huntington's chorea. The correct explanation: Emma's genotype is Hh, the father's genotype has to be hh. A cross between only these two genotypes (Hh and hh) will ensure that there is a 50% chance of a child not inheriting the disease because a child inherits one recessive allele from each parent.

(f) Learners should be given sufficient exercises on how to convert base sequences in protein synthesis, i.e. from DNA to mRNA (codons) to tRNA (anticodons) to amino acids, and the reverse process. Teachers should use the questions on this section from previous national question papers and also refer to strategies suggested in previous diagnostic reports.

(g) Learners should be given many opportunities to work out monohybrid crosses involving complete dominance, incomplete dominance and co-dominance.Learners must also be taught the format for writing out genetic crosses (which can be found in previous diagnostic reports) so that they can get at least 2 marks even if they did not successfully solve the genetics cross.

QUESTION 3:
EVOLUTION, GENETICS, SCIENTIFIC INVESTIGATION

Common errors and misconceptions

(a) Poor performance in Q3.1 despite answers being accessible in the text provided, indicates that candidates experienced difficulty in comprehending and interpreting textual information.

(b) In Q3.2.1 (b), many candidates failed to identify the dependent variable in the investigation. Many candidates also failed to identify that Q3.2.3 was a question on *reliability* and that Q3.2.4 was a question on *validity*.

(c) Most candidates simply described the process of natural selection in Q3.2.5 without contextualizing it to the specific example of the lizards given in the question. They mentioned *variation* without describing the variation as it applied to the lizards in the question. In cases where the variation was described, many candidates did not identify the favourable and unfavourable characteristics relating to this variation. Many candidates also failed to identify the appropriate selection pressure that was at play in this specific example which in this case was *predation* (the black colour lizards were camouflaged well against the dark rocks and escaped predation, while the brown and red lizards were easily spotted and thus susceptible to predation).

(d) In Q3.3, most candidates provided a general account on speciation without contextualizing it to the specific example given in the question. For example, they failed to mention that the geographical barrier in this particular case was the sea/continental drift which separated the original population of camels into 3 populations.

(e) In Q3.4, many candidates could not write down the alleles that control blood groups and explain how offspring inherit these alleles from their parents.

Suggestions for improvement

(a) Teachers should provide multiple opportunities for learners to interpret textual and other information. Special attention should be given to strategies that would assist learners in identifying the key information in the text so that it could be used as clues in the answering of the questions. Teachers must select appropriate material from other sources, not only from textbooks e.g. newspapers and science journals. Subject advisors should also give some exemplars of source material that teachers could use to summarise the information and set contextual questions based on the source material, including questions that assess higher order cognitive levels.

(b) Independent and dependent variables should be identified from the aim of the investigation. In Q3.2, e.g. scientists investigated the relationship between the colour of lizards in a population and their survival rate on an island, the independent variable is *the colour of lizards* and the dependent variable is *the survival rate of the lizards*.

Teachers should clearly differentiate among the three types of variables as follows:

Controlled / fixed variable – refers to the factors that should be kept constant so that the results of an investigation can be considered valid.

Independent variable – refers to the factor that is being investigated. This factor is usually manipulated by the investigator either at the start of or during the course of the investigation. The independent variable appears on the X-axis of a graph.

Dependent variable – refers to the effect of the independent variable. This effect is usually measured in some way and appears on the Y-axis of a graph.

Teachers need to teach learners to differentiate between *validity* and *reliability* in scientific investigations, because the principles of validity and reliability are fundamental cornerstones of the scientific method.

What is reliability?

- The idea behind reliability is that any significant results of an investigation must be more than a once-off finding and should be repeatable.

- Other researchers must be able to perform exactly the same investigation, under the same conditions, and generate the same results. This would reinforce the findings of the investigation and ensure that the wider scientific community accepts the hypothesis.

- For questions that require learners to state how the reliability of an investigation could have been improved, the following answers may apply depending on the nature of the investigation:

  - Repeat the investigation

  - Take many readings and use the average

  - Randomly select a sample

  - Increase the sample size

  - Increase the period of the investigation.

What is validity?

- Validity questions how the investigation was carried out. It is important to be sure that all the factors have been controlled/fixed except the factor being tested.

- In questions that require learners to suggest some factors that might have decreased the validity of an investigation, learners should identify some factors that were not fixed/controlled when carrying out the investigation.

(c) Teachers should provide multiple opportunities for learners to answer questions based on an application of the concept of natural selection. Particular guidance must be provided on how to contextualize the general account to the specific example stated in the question. In any example, the learner must be able to describe the variation and be able to differentiate between the characteristic that is favourable from that which is unfavourable. In addition the selection pressure for natural selection should be identified for the specific example cited in the question.

The table that follows indicates how a general account (based on recall) can be adapted to answer an application question (as in Q3.2.5).

General Account on Natural Selection	**Natural Selection in the Lizard Population**
There is variation amongst the offspring	There is variation amongst the lizard population
Some have favourable characteristics and some do not	Some are black and are better camouflaged/ warm up faster to have energy to avoid predators, whilst others are red or brown and are NOT camouflaged/cannot warm up fast enough to have energy to run away from predators
Sometimes there is a change in the environmental conditions which acts a selection pressure	Predation acts as the selection pressure. Survival depends on the colour of the lizards.

Organisms with characteristics that make them less suited to the environment, die	Red and brown lizards are caught by predators and die
Organisms with characteristics which make them more suited to the environment, survive	Black lizards survive
The organisms that survive, reproduce	The surviving black lizards will reproduce
They will pass on the favourable characteristic to their offspring	The allele for black colour will be passed on to the next generation
Over many generations, the proportion of individuals with the favourable characteristic, increases	Over many generations the proportion of lizards that are black, increases

(d) Teachers should provide multiple opportunities for learners to answer questions based on an application of the concept of speciation. Particular guidance must be given on how to contextualize the general account to the specific example stated in the question.

(e) Subject advisors should ensure that the attention of the teachers is drawn to the correct allelic nota tion that should be used when writing genotypes for the various blood groups as prescribed in the 2014 Exam Guideline Document for the Life Sciences. The allele notation $\mathbf{I^A}$, $\mathbf{I^B}$and **i** must be used.

QUESTION 4:
'OUT OF AFRICA' HYPOTHESIS

Common errors and misconceptions

(a) This question was generally poorly answered. Candidates lost marks or did not receive credit because they:

- Did not state the 'Out of Africa' hypothesis as asked for in the question
- Did not write the essay under sub-headings – candidates were credited for recognising the types of evidence, i.e. fossil evidence, genetic evidence and cultural evidence
- Confused fossil evidence with genetic evidence
- Wrote extensively on Y chromosome evidence when this is not in the Examination Guideline document – 2014
- Did not write about the structures in fossils, that indicated that the fossils of *Ardipithecus*, *Australopithecus* and early *Homo* species were bipedal. The 3 features, which are evidence for bipedalism (position of the foramen magnum, shape of the spine and shape of the pelvic girdle) are stated explicitly in the Examination Guideline Document – 2014
- Described the significance of bipedalism, which was not required in this question
- Did not select and apply information that they learnt about the fossil record in Africa

Suggestions for improvement

(a) Teachers should offer more opportunities for learners to write answers in paragraph and essay formats. The logical sequence of an account on the 'Out of Africa' hypothesis should have the steps in the correct order, for example:

- State the 'Out of Africa' hypothesis – All modern humans/*Homo sapiens* originated in Africa and migrated to other parts of the world. The use of the concept 'modern humans' excludes *Homo neanderthalensis* which originated in Europe.
- Fossil Evidence – Fossils of *Ardipithecus*, *Australopithecus* and *Homo habilis* were ONLY found in Africa and nowhere else in the world. The OLDEST fossils of *Homo erectus* and *Homo sapiens* were found in Africa. Candidates needed to select/apply the knowledge learnt about the fossil record found in Africa to the question asked in this essay.
- Genetic Evidence – Describe evidence from mitochondrial DNA.
- Cultural Evidence – The oldest/most primitive artefacts were found in Africa.
- Bipedalism – Candidates needed to describe the position of the foramen magnum, the structure of the spine and the pelvis in fossils as evidence that the 3 genera were bipedal.

(b) Teachers must make use of the *Mind the Gap* study guide to assist learners in the use of mind maps in the planning of an essay.

(c) Learners should be reminded that synthesis is made up of three parts: relevance, logical presentation and a comprehensive answer. The allocation of marks for synthesis should be explained to them and used from grades 10 to 12. The following mark allocation for synthesis applies to Q4 in this paper.

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the question	Ideas are arranged in a logical/cause-effect sequence	All aspects required by the essay have been sufficiently addressed
In this essay in Q4	Only information relevant to the 'Out of Africa' hypothesis and bipedal features of the three genera are described. No irrelevant information included.	The description of the evidence for the 'Out of Africa' hypothesis and the evidence of bipedalism is presented in a logical and sequential manner.	At leastthe following marks should be obtained: - **7/11** for the 'Out of Africa' hypothesis and the evidence - **4/6** on evidence for bipedalism.
Mark	1	1	1

Teachers should use the current and past examination essay questions to deliberately teach learners the skill of interpreting the question to determine what is required. Key words in the question should be underlined.

(d) Subject advisors should train teachers on the application of the criteria for synthesis. This can be done by giving different teachers the same sample script to mark and to which synthesis marks are allocated. This should be followed by a discussion with reasons on whether the answer in the sample script should be awarded a mark for each aspect of synthesis.

CHAPTER 10. MATHEMATICAL LITERACY

The following report should be read in conjunction with the Mathematical Literacy question papers of the November 2016 Examination.

10.1. PERFORMANCE TRENDS (2013 – 2016)

The overall performance at 30% and above was similar in 2015 and 2016. The achievement at 40% and above has increased by 2,1% from 2015 to 2016.

Table 10.1.1 Overall achievement rates in Mathematical Literacy from 2013 – 2016

Year	No. Wrote	No. achieved at 30% and above	% achieved at 30% and above	No. achieved at 40% and above	% achieved at40% and above
2013	324 097	282 270	87.1	202 248	62.4
2014	312 054	262 495	84.1	185 528	59.5
2015	388 845	277 593	71.4	172 214	44.3
2016	361 948	257 926	71.3	167 811	46.4

Figure 10.1.1 Overall achievement rates in Mathematical Literacy (2013 – 2016)

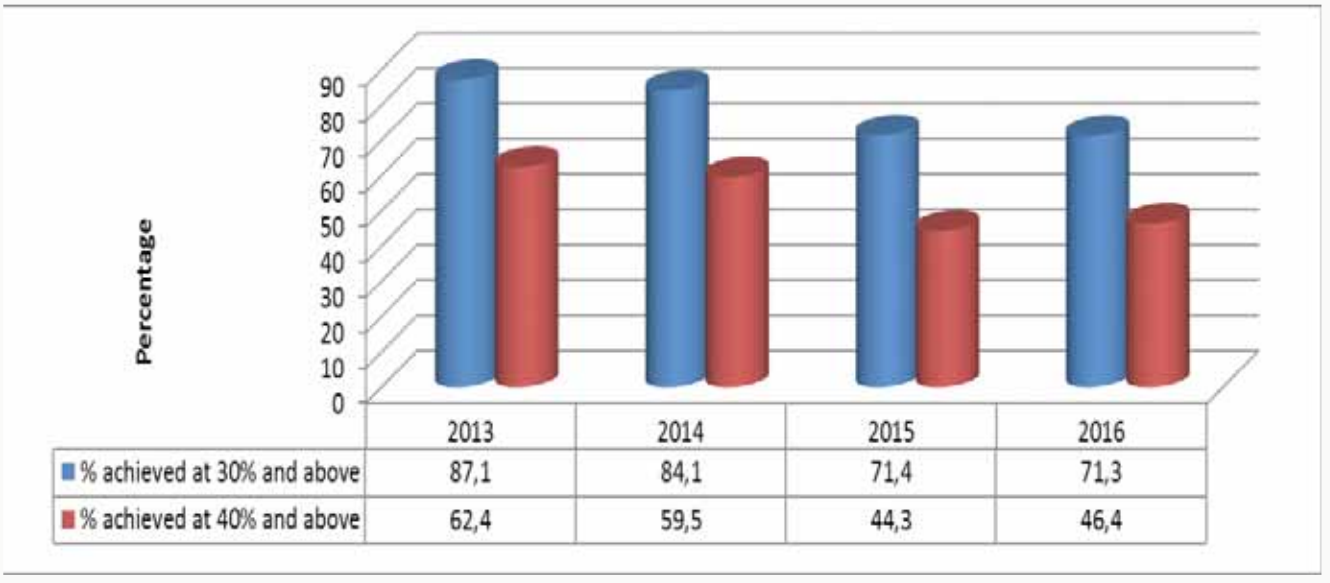
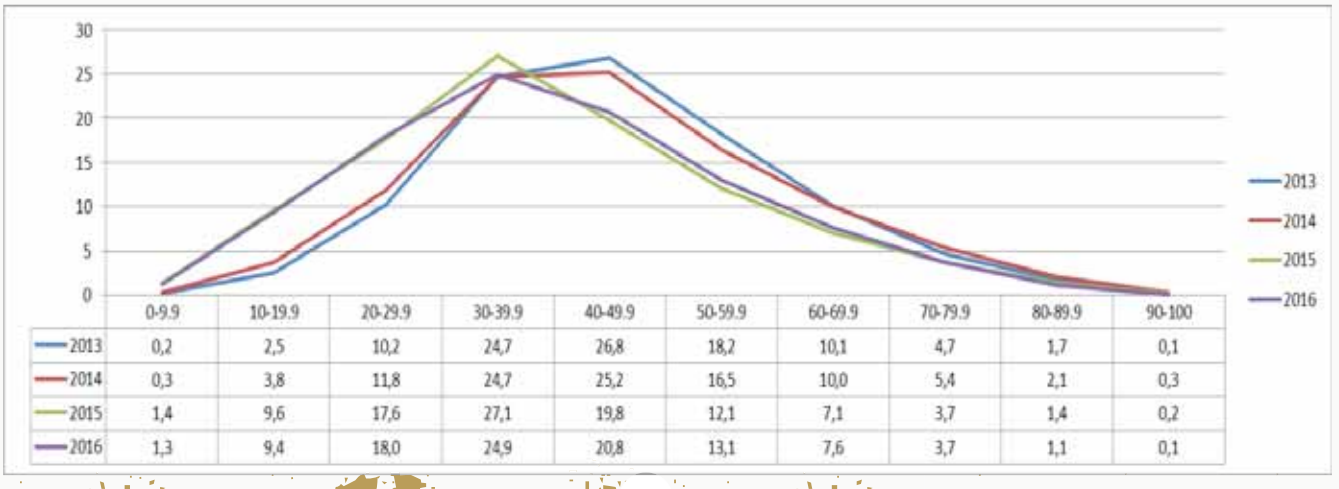


Figure 10.1.2 Performance distribution curves in Mathematical Literacy (2013 – 2016)



10.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

General comments

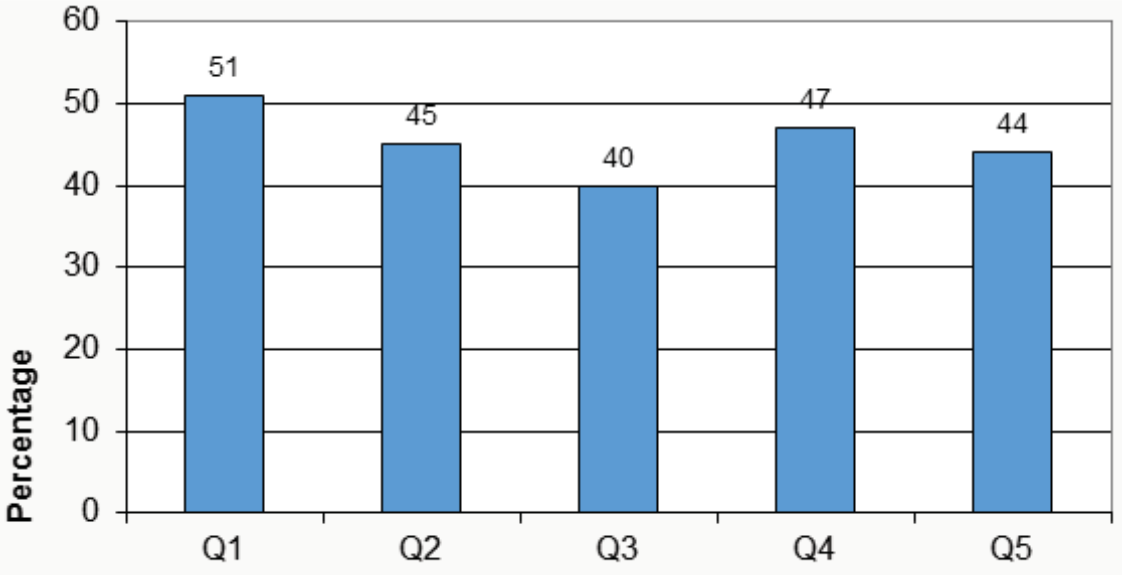
(a) The performance of candidates is lower than that recorded in the past due to the fact that all questions are set in context.

(b) The overall performance is similar to the performance in 2015.

10.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

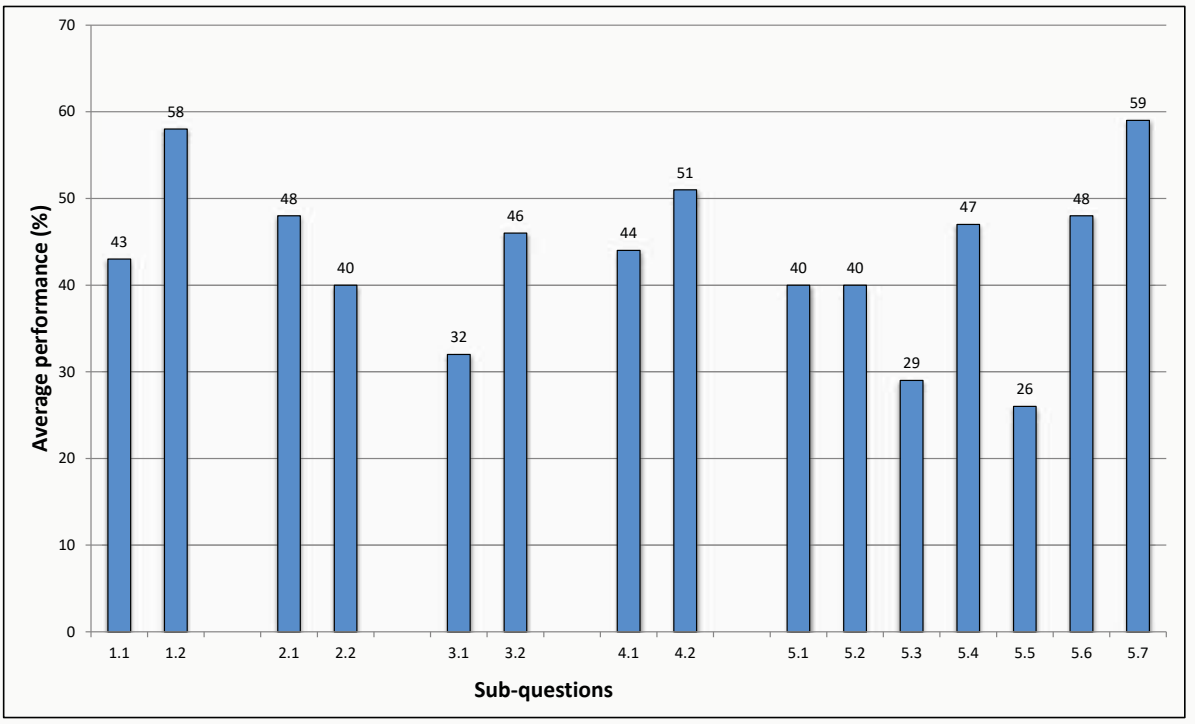
The following graph was based on data from a random sample of candidates. While this graph may not accurately reflect national averages, it is useful in assessing the relative degree of challenge of each question as experienced by candidates.

Figure 10.3.1 Average percentage performance per question for Paper 1



Question	Content	Average %
Q1	Finance	**51**
Q2	Measurement	**45**
Q3	Maps and Plans	**40**
Q4	Data Handling	**47**
Q5	Exchange Rates; Data Handling	**44**

Figure 10.3.2 Average percentage performance per sub-question for Paper 1



10.4. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 1

Learners performed poorly in comparisonwith previous (pre-CAPS) years but an improvement from 2015 is noted. CAPS is definitely more difficult for the learners since all questions in CAPS are all set in terms of real life context.

QUESTION 1: FINANCE (HOME LOAN STATEMENT; FUND RAISING EVENT)

The performance of learners in this question ranged from good to fair with an average performance of 51%.

Common errors and misconceptions

(a) In Q1.1,the majority of candidateshad difficulty reading information (example: borrower; end date of loan period) from the home loan statement or understanding terminology used on the statement (example: home loan; credit; debit).

In Q1.1.4, candidates, managed to read the monthly administration fee of R5,70 but they failed to calculate the total administration fee for 20 years. This is an indication of their inability to convert 20 years into months.

(b) In Q1.1.5, most learners subtracted instead of adding.

(c) In Q1.1.6,candidatesstill experienced problems with reverse VAT calculations, i.e. the determination of the VAT amount from the given VAT inclusive value. The calculation should be $(\frac{14\%}{114\%} \times$R5,70) as one of the methods. Most learners simply calculated 14% of R5,70.

(d) Candidates could not explain concepts in their own words, as was required of them in Questions 1.1.7 and 1.2.1. The terms to be explained were basic terms in finance that did not require special or advanced competency in the language. The problem is that many teachers are not using English as the medium of instruction.

(e) In Question 1.1.10, candidates had a problem in picking up the correct "…balance on 1st of the previous month", given as B in the formula, as there were three values as balances in the month. The correct value was the balance after the monthly repayment was done.

(f) In Q1.2.1, many candidates could not define the term *variable cost*.

(g) In Q1.2.2, most of the candidates could not substitute into the given formula.

(h) In Q1.2.3, most of the candidates did calculations instead of reading the information from the graphs given.

(i) In Q1.2.4 (a),candidates could not draw an income graph when given theselling price per ticket.

Suggestions for improvement

(a) Learners must be exposed to a variety of financial documents, not only pay slips and salary advice, so that they can read and extract information from it to respond to questions.

(b) Learners should double check their responses, especially where they think questions are too easy, as in Questions 1.1.4 and 1.1.5. In these questions, the basic concepts like there being 12 months in a year and that reverting back to an original amount after a decrease means adding, were lost.

(c) The difference between VAT inclusive and exclusive must be emphasised and more exercises should be provided to learners.

(d) One way of improving learners' language competency is to resuscitate the culture of reading in schools in general and in Mathematical Literacy classes in particular as the subject requires a lot of reading with understanding. The English Across the Curriculum (EAC) strategy is one intervention that is aimed at addressing the problem and should be taken seriously in Mathematical Literacy in particular. It may also be of assistance for learners to develop a glossary of terms for the subject. There is chance that many candidates guessed an answer (credit or debit) in Question 1.1.9(b).

(e) A glossary document with all terms and their definitions has to be developed and used.

Teachers are advised to study the CAPS document when planning lessons and setting SBA tasks in order to ensure that learners are familiar with Mathematical Literacy terminology.

(f) Learners should be trained to identify the specific information reflected in tables, graphs or financial documents.Teachers must enhance learners' skill to interpret and filter the information given in the question in order to select the correct information to be used in calculations.

(g) Learners must establish a pattern of transactions for each month in the given loan statement. For instance, each month reflected: Interest - Monthly administration fee - and then Debit order, except for the month that had an adjustment. This order of transactions would then assist in understanding the different balances in a month in order to make the correct choice.

(h) The learners should be drilled on basic operations, such as using a calculator, applying the BODMAS rule, rounding off and conversions.Q1.2.2 required the following:

Total cost = 6000 + 230 x 45 Total cost = 6000 + 230 x 45

= 6230 x 45 **instead of** = 6000 + 10350

= 280 350 = 16 350

(i) Learners must be taught to draw basic graphs from given information.

QUESTION 2:
MEASUREMENT (PERIMETER; AREA;VOLUME; TIME)

The performance of learners in this question was fair with an average performance of 45%. Candidates who failed to visualise the given 3-D figure encountered problems as indicated in specific questions. The conversion between units of measurement is another problem that consistently recurs.

Common errors and misconceptions

(a) Most candidates did not understand the layout plan in Q2.1. This is probably due to insufficient exposure to classroom exercises on layout plans.

(b) In Q2.1.1(a), candidates managed to get the value of *d* which is 1,2 m but conversion to

mm was a challenge.

(c) In Q2.1.1 (b), the use of total length in the context confused most candidates.They wrote

16,2m as the total length. They did not realise that the total length is the perimeter

of the runaway.

(d) In Q2.1.1(c), candidates calculated one area only and thus lost 2 marks.They took area to mean'length x width' as suggested by the given formula. They did not realize that the required area was the sum of areas of the two rectangular shaped figures.

(e) In Q2.1.1 (d), candidates used 15m in the calculation assuming that it is the length of the runaway. Other candidates used 39m which is the total length of the exposed sides of the runaway in Q2.1.1 (b) to calculate the length of the runaway. Many candidates were under the impression that 1/3 of x = y is the same as 1/3 of y = x.

(f) In Q2.2.1, conversion to cm was not done and did not know how to find the square root.

(g) In Q2.2.2 most candidates substituted correctly into the formula but the use of the calculator was a challenge because their answers were not accurate. They also failed to calculate the total area of the labels. Other candidates substituted the value of the radius as 3,5 cm instead of 7 cm. The final answer was rounded off to 1 decimal instead of two.

(h) In Q2.2.4, most candidates wrote the wrong unit.This shows that they have no knowledge of a metric unit of measure despite the whole of the section on measurement in the curriculum dealing with units of measurement.

Suggestions for improvement

(a) Teachers must use terms like total length instead of perimeter when asking questions on measurements.

(b) Learners should be taught to copy the formula as it is given and substitute carefully to avoid mistakes.

(c) Teachers must re-enforce mathematical terms such as *radius* and *diameter* on a regular basis.

(d) Rounding off to one decimal or to a whole number should be done from the lower grades.

(e) Different ways of conversion should be done in order for learners to understand it clearly.It would be advisable that learners are drilled on basic mathematical knowledge as a way of preparing them for the subject. For example:Finding a square root of a numberand the notion that 2π means 2 X π.

(f) The appropriate metric unit of measure for the mass of a particular container should be done practically using real life examples.

QUESTION 3:
MAPS AND PLANS

This question waspoorlyanswered with an average of 40%.Two main contributory factors in this regard are as follows:

(i) The compass direction given with an arrow pointing downwards indicating north (N) seemed to be have confused some learners.

(ii) Poor learner language competency

Common errors and misconceptions

(a) In Q3.1.1, candidates multiplied 15 seats in middle row block A by 9 rows in middle block and received no credit. Candidates failed to realize that the rows do not have the same number of seats. Other candidates added the seat numbers in middle block row A

e.g. 18 + 19 + 20 +…

(b) In Q3.1.2, most candidates wrote SE as the answerwithout checkingthe direction of North on Annexure B.

(c) Q3.1.3, most candidates wrote E28 because it is the middle row and in the middle block.

Others wrote 31 as an answer. Having seen an odd number in the description they thought it is the seat number that Rahim is seated in that is odd. Besides this misinterpretation, some candidates were also misled in the sense that the impression given is that the row Rahim is seated in, is furthest from the stage.

(d) In Q3.1.4, candidates were not aware of where North was facing and as such they did not get the direction correct. Most candidates used entrance/exit 2 to refreshment stand 2 instead of entrance/exit 1 to refreshment stand 1 not realizing that the latter was the shortest route.

(e) In Q3.1.5, candidates failed to key in % on the calculator and therefore arrived at the incorrect answer.

Other candidates did not realize that they were first required to determine 87 ½ % of the total number of seats. The total was only given in the addendum and therefore missed by many candidates. As a result, they calculated the number before determining the percent.

(f) In Q3.1.6, most candidates chose 0 as the answer for 'most unlikely' whereas 0 denotes 'impossible'.

(g) In Q3.2.2, candidates determined the number of screws using the incorrect diagram, thus arriving at the answer of 1 screw. Other candidates made the assumption that there was a screw at the base (although not visible) and hence provided the answer of 4 screws instead of 3.

(h) In Q3.2.4, candidates were able to multiply 62 mm by30 but wrote their final answer in *mm* not in *metres*.

Suggestions for improvement

(a) Maps, plans and other presentations of the physical world must be treated practically where possible so that the interpretation can be easily understood.

(b) Plans and other forms of representations require a thorough analysis before questions on it are answered. Besides the command of compass directions involved in plans, language becomes another significant aspect. It is therefore imperative that candidates satisfy themselves that they have the correct interpretation of direction before attempting the questions. This is the culture to be inculcated through classroom practice.

(c) Candidates should not only be taught to calculate probability but should also be able to relate a probability expressed in words to a numeric probability. In real life probability is often expressed in words and learners ought to have a mathematical sense of such expressions.

(d) Diagrams on the assembly of electrical appliances, children toys etc. should be done from grade 10 and if possible practically demonstrated in the classroom.

QUESTION 4:
DATA HANDLING

Learners' performances in this question was good to fair, with an average of 47%

Common errors and misconceptions

(a) Seeing "… the difference between the highest and the lowest land-speed records…" in Q4.1.1, most candidates simply calculated the difference between the highest and the lowest scores in the table as in calculating the range. This showed that the question was not read with understanding. The fact that the two years referred to as the cut of points were not provided in the data puzzled many candidates when in fact that only meant that in those years there were no records set.

(b) In Q4.1.3, candidates identified two wrong years e.g. 1930 and 1937 but they did not indicate the number of years the record remain unbroken.

(c) In Q4.1.4, the question was well attempted but few candidates wrote Rocky Robinson because he is the last one on the table.

(d) In Q4.1.5, candidates failed to provide the number of years in the 21st century. Other candidates wrote the answer as a ratio e.g. 5: 25 and not as a percentage.

(e) In Q4.2.1, most candidates assumed that they had to write on what the data was about instead of whether or not the data was discrete.

(f) What puzzled candidates in Q4.2.2 was that the table gave the impression that there were three separate age groups when in fact the last was simply the combination of the first two. Hence candidates gave the age group 7 to 18 as the answer.

(g) In Q4.2.3, candidates identified 2006 as the year that showed best attendance maybe because it had the highest number of children not attending any educational institution, hence giving the response to the lowest attendance and not the best attendance.

(h) In Q4.2.4, candidates were not sure what to do to find the value of A. Most candidates did not answer the question. They did not notice that the 7 to 18 age group was the sum of number of children in the 7 to 15 and 16 to 18.

(i) In Q4.2.5, candidates used the wrong method to find the value of B. They calculated the mean of the 7 to 15 age group using the percentage column instead of writing thenumber given as a percentage of the total number of learners.

(j) In Q4.2.6, candidates who scored 0 in this question did not use the provided answer sheet to draw the graph but drew the graph in the answer book. In many cases, the plotted points were not in line with the appropriate years.

Suggestions for improvement

(a) Teachers must expose learners to more questions on classifying and organising representation of data.

(b) Learners must be assisted to interpret data during normal teaching.

(c) Learners need to be trained to read information from tables.

(d) Learners must be taught how to use answer sheet during. Copies of the answer sheet should be provided to learners when teaching graphs.

(e) Sketching of statistical graphs such as bar graphs must be practised. Learners who knew how to draw these graphs, scored good marks for the question.

QUESTION 5:
FINANCE AND PROBABILITY

Learners' performance in this question was fair, with an average of 44%.

Common errors and misconceptions

(a) In Q5.1.1, candidates wrote *Germany* because on the exchange rate column R16,28 is the highest value. Candidates did not know what they were looking for. Indications are that they did not know the concept of 'a currency stronger than another currency'.

(b) In Q5.2, candidates multiplied R16 by 0,070 instead of dividingR16 by 0,070.

(c) In Q5.3.1, most candidates multiplied €1,68 by R113,96 instead of dividing R113,96 by €1,68.

(d) In Q5.3.2, candidates subtracted Rs 74 from Rs 267 instead of dividing 56,07 by 267. Other candidates swapped the values and divided 267 by 56,07.

(e) In Q5.4, candidates managed to identify the correct values but the order was incorrect and the answer was given as a unit ratio, instead of 8 : 2,5 = 16 : 5 they wrote 1 : 3,2

(f) In Q5.5, most candidates could not identify countries that have almost similar purchasing power. They might have looked for two currencies that are close to each other or two currencies close to each other compared to the South African Rand and could not proceed further.

(g) In Q5.6, most candidates wrote the middle number, they did not mention anything on data having to be arranged first.

(h) In Q5.7.1, candidates arranged the data on 'Big Mac Burger' with different currencies instead of using the values in South African rand. Other candidates arranged the data in ascending orderinstead of descending order.

(i) In Q5.7.2, candidates used values from Q5.7.1 but divided by 10 instead of dividing by 11.

Suggestions for improvement

(a) Learnersneed to do more practice inreading information from tables.

(b) Learners should have greater exposure on currency conversion of different world currencies by using currency tables from national newspapers.

(c) Arranging the data in descending or ascending order should be done when teaching data handling.

(d) Learners should be made aware of difference between a unit ratio (as in 1:x) and a ratio in its simplest form, Example 8 : 2,5 in simplest form is 16 : 5 BUT in unit form is 1 : 3,2. Simplest form is a ratio in terms of whole numbers.

(e) The concept of purchasing power needs to be understood in relating the R95,22 South African value required to buy a Big Mac Burger in Brazil against the R95,57 South African value to buy the same item in the United States of America.

10.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

General comments

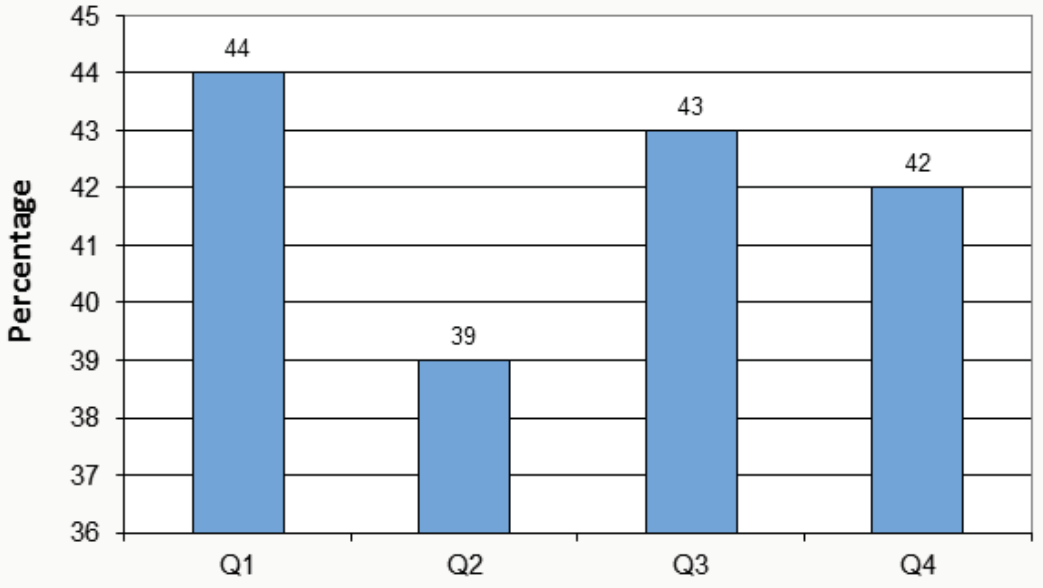
(a) The performance of candidates is lower than that recorded in the past.

(b) There is a decrease in the number of candidates obtaining 80% to 100%, and in the number of candidates obtaining 70% to 79%.

10.6. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 2

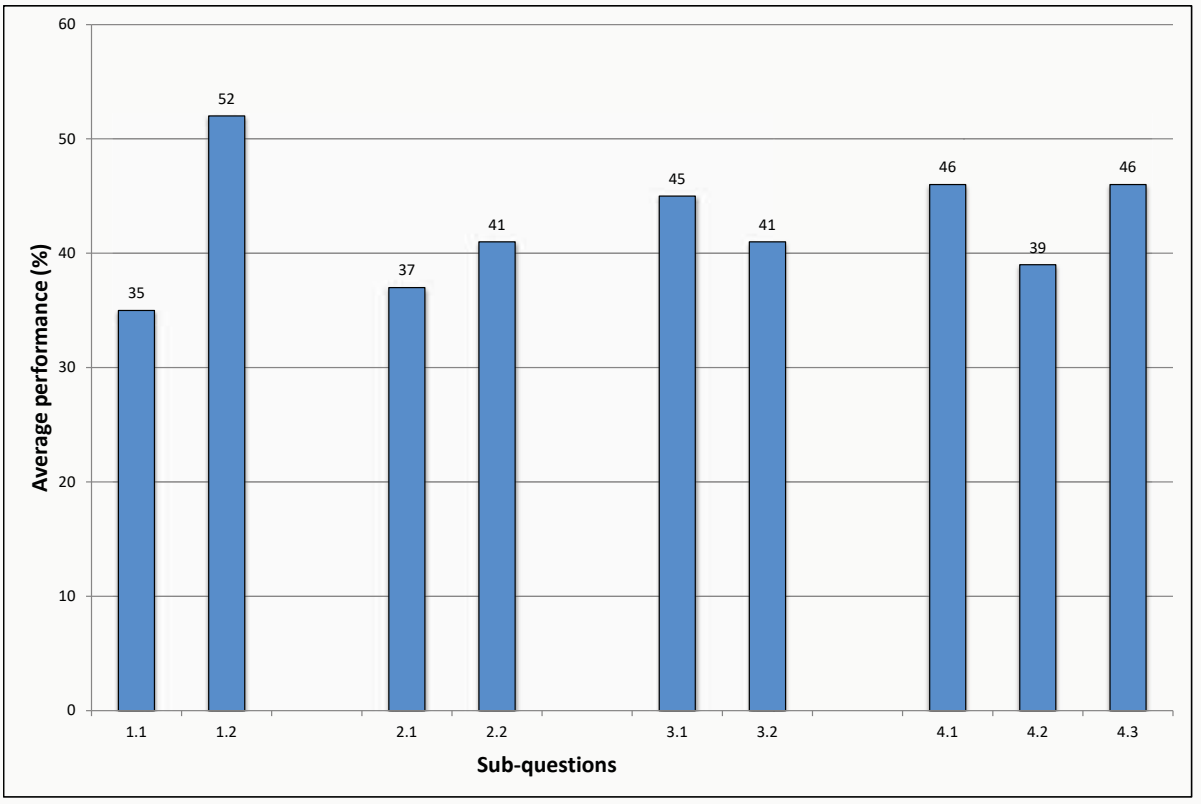
The following graph is based on data from a random sample of candidates. While this graph may not accurately reflect national averages, it is useful in assessing the relative degree of challenge of each question as experienced by candidates.

Figure 10.6.1 Average percentage performance per question



Question	Content	Average %
Q1	Finance (banking fees; wages); Analysingthe shipping of Computers	**44**
Q2	Analysis of Tourism in South Africa; Planning a train trip	**39**
Q3	Analysis of water in a swimming pool; Data analysis of swimming lessons	**43**
Q4	Analysis of elevation map; Map of a zoo; Analysing of data on visiting times to the zoo	**42**

Figure 10.6.2 Average percentage performance per sub-question in paper 2



10.7. ANALYSIS OF LEARNER PERFORMANCE IN INDIVIDUAL QUESTIONS IN PAPER 2

QUESTION 1: FINANCE (BANKING FEES; WAGES); ANALYSING THE SHIPPING OF COMPUTERS

In general this question was fairly answered by candidates.The average percentage for question 1 was 44%

Common errors and misconceptions

(a) In Q1.1.1, some candidates did not read the "NOTE" which indicated that workdayswere from Monday to Friday and thus included all the days in October. Some candidates could not identify even numbers and hence used all the working days in October. Some candidates expressed probability in the form of a ratio and not a fraction or percentage.

(b) Candidates' responses to question 1.1.2 were based on the bank charges instead of the benefit of using a bank offering the lowest charges. Some of the responses were also based on what the company and its employees will benefit from within the company rather than the benefit of using a bank offering the lowest charges.

(c) Some candidates used the wrong application of the mathematical operations as they were unable to use a calculator correctly in Q1.1.3.(c). Many candidates went straight to the given % change formula

without first calculating the 2014 fee and could therefore not proceed further.

(d) In Q1.1.4, some candidates multiplied the weekly amount of R15 000 by 4 instead offirst calculating the withdrawal fees and multiplying the withdrawal fees by 4. Other candidates failed to recognise the value'four' as it was not written numerically.

(e) In Q1.1.5 some candidates only considered the weekly wages and omitted the two days wage that formed part of the working days of the month, and hence they calculated the total wage for 4 weeks instead of 22 days.

(f) Some candidates had a challenge in Q1.2.1 as they could not interpret the word 'shipment' correctly. They wrote their answers in terms of goods transported by ship only.

(g) In question 1.2.2, candidates only calculated the total number of computers for 2012 and 2013 without determining the difference. Some candidates only stated that 2012 is more than 2013 without any calculations beingdone.

(h) Candidates could identify the values but could not calculate the percentage change because the formula was not given.

Suggestions for improvement

(a) Learners should be taught to analyse the given information before attempting to answer the questions set on it.

(b) More exercises on probability such as the outcome of an event and the interpretation of outcomes like impossible, likely, unlikely and certainty, needs to be taught.

(c) Teachers must always ask high-level questions during the teaching of any topics. Candidates should be taught on how key words such as explain, verify and determine can be used to determine how a question should be answered.

(d) Learners should be taught to substitute directly into the given formulae rather than trying to change the subject of the formula before substituting.

(e) Learners must understand what millions and billions look like in an expanded form. Exercise on calculations involving large numbers must be given in order for learners to understand how to work with millions and billions.

(f) Certain formulae,such as that for percentage change, needs to be known. Learners must be aware that especially in Paper 2, formulae may not be always given.

QUESTION 2:
ANALYSIS OF TOURISM IN SOUTH AFRICA; PLANNING A TRAIN TRIP

On the whole, learners' performance in this question was poor. The average scored for this question was under 40%.This poor performance could be attributed to quite a number of factors over and above learner misconceptions and conceptual errors. These include the fact that this is the question that had the highest marks (47), the graphical representation of the information provided was in four parts, and the entire question was based on one context.

Learners' tendency to experience a complete breakdown in the last part of the question is indicative of the

fact that they failed to comprehend all the information provided. All these factors were compounded by the involvement of big numbers in the question.

Common errors and misconceptions

(a) In Q2.1.1 (a), candidates calculated 9, 7% of R218, 9 billion instead of calculating the percentage increase on the 2012 value. Others calculated the percentage increase on R218, 9 billion. The point missed here is that if the previous value grew by 9.7% to R218.9 billion then the R218.9 billion is 109.7% of the previous value. They were required to find x if 9.7% of x = R218.9 billion.

(b) Candidates struggled to find the appropriate wording to express their opinions in Q2.1.1 (b). Candidates understood 'first decimal place' as referring to cents and thus chose toround billions of rand to a whole number thinking it to be more accurate than rounding to one decimal place. The fact that 0,1 billion is a large amount was not understood by candidates.

(c) Candidates did not know how to approach Q2.1.2. It is evident that the candidates did not master the 'average' concept. Some only calculated 43% of R218,9 billion and could not continue. Those who managed to continue were not sure of how to write a billion rand and a million people numerically in order to divide the total number of rand by the total number of people.

(d) There are candidates who are still having a challenge in differentiating between the 'the least' and 'the most' as some gave responses of the items that tourists had spent the most money on in Q2.1.3 instead of the least amount of money. There were also candidates who responded to this question correctly but only identified one item instead of two.

(e) In Q2.1.4, some candidates provided an example of a 'tourism-related item' using the items that have been indicated for tourist spending on the addendum instead of other items not given on the addendum.

(f) Some candidates treated Q2.1.5 as a simple interest question instead of compound interest. Some of those who managed to recognize that it was a compound interest question tried to make use of the compound interest formula but used the incorrect formula or substituted incorrectly.

(g) In Q2.2.1 (a), candidates did not calculate the difference of time in some railway stations and hence worked with less than 16 railway stations. Some candidates found it difficult to calculate the time at Springfontein and Queenstown as these two railway stations required them to convert hours into minutes. Other candidates calculated the full travel time including stopover times whereas the question stated 'excluding stopover times'.

(h) Candidates who did not write down the stopover times in Q2.2.1 (a) could not determine the modal stopover time in Q2.2.1 (b).The answer was bimodal but many candidates wrote down only ONE mode instead of two.Other candidatesused the two modes 2 and 3 and divided by 2 to give a final answer of 2,5 indicating that they did not understand the bimodal concept.

(i) In Q2.2.1(c), the travelled time was problematic to calculate as candidates had to subtract the stopover time and also convert minutes to hours in order to determine the average speed. The majority of the candidates did the changing of the subject of the formula and the substitution incorrectly.

(j) The total cost for the family in Q2.2.2 seemed to be problematic as learners only attempted a single trip and could not make use of the discounts offered. Many candidates only calculated the return trip. This indicates the misinterpretation of '…the return train trip…'as meaning the train trip to come home only. Some calculated the discount but did not subtract the discounts from the original fare price in order to

reduce the total cost.

Suggestions for improvement

(a) Learners should be taught how to work from a new value to the original value when working with a percentage which is based on the same principle as a VAT inclusive question and then finding the price before VAT.

(b) Learners should be taught the financial impact of rounding a billion rand to ONE decimal placeinstead of rounding to a whole number.

(c) Learners should be taught how to work with large numbers, especially millions and billions in number format as well as converting large number from billions to millions and vice versa.

(d) Learners need practise on how to analyse charts, tables and graphs, especially pictographs.

(e) Avoid teaching learners how to work with the compound interest formula as it is not prescribed in the CAPS document. Learners should be taught to calculate compound interest as a step-by-step process using the simple interest formula.

(f) Learners should be taught how to work with time scenarios and be able to add and subtract time using hours and minutes and a combination of both.

(g) Learners must be taught to understand and interpret bus and train schedules in order to make sense of it.

(h) Learners need to be trained to read and understand the scenario given before they attempt to answer the questions.

(i) Where questions require the calculation of speed in km/h, learners should be taught that if the time includes minutes, they first have to convert the minutes to a part of an hour.

QUESTION 3:
ANALYSIS OF WATER IN A SWIMMING POOL; DATA ANALYSIS OF SWIMMING LESSONS

This question was answered fairly. The average percentage performance in this question was 43%.

Common errors and misconceptions

(a) Many candidates were unable to interpret the diagram to calculate the volume of the whole swimming pool in Q3.1.1. The failed to realize that the volume of the problematic section was given, and that they had to identify the dimensions of each of the sides of the other two sections.

(b) In Q3.1.2, many candidates struggled to find 94% of 765 m^3. Some candidates could not convert the answer to gallons as they had to first convert it to litres.The relationship betweenm^3 and gallons was not given. Conversion of units of measurement was only given between gallons and litres and between m^3 and litres.

(c) In Q3.1.3,candidates were unable to convert days to hours and vice versa in order to calculate how long, in terms of days, it would take to fill the pool with water.

(d) Candidates are still struggling with measures of central tendency and spread. This was evident in Q3.2.1 (mean concept and manipulation of formula), Q3.2.2 (identification of quartiles) and Q3.2.5 (comparing without indicating a concluding statement).Q3.2.1 was supposed to be a simple question if the mean concept was well taught. Candidates did not use 2x in the calculations, showing evidence of a lack of understandingthat like terms should be added together. Candidates are only shown how to find the mean and not taught to find the missing value when the mean is given.

(e) Language was a challenge in Q3.2.3 as candidates were not able to express themselves in order to compare attendance for the given days. Some just wrote 'attend more' without giving a reason as was required by the question.

(f) Candidates did not relate the given information from the scenario hence they could not write the correct numerator when determining the probability in Q3.2.4. Those who managed to calculate the probability did not round off their response to the nearest percentage.

(g) In Q3.2.5, candidates did not know how to interpret the box and whisker plots. It would appear that they are only taught how to calculate quartiles without explaining what each quartile means in relation to the given data.

Suggestions for improvement

(a) Performance in space, shape and measurement is not only poor in Mathematical Literacy but also in Mathematics. This would suggest that the problem is pedagogical in nature and can be traced to primary education. Intensive workshops focusing on space, shape and measurement for all primary school teachers are recommended.

(b) When conversion tables are given to learners, learners should be taught when to multiply or divide using the given information.

(c) Learners should be taught how to convert from days to hours and vice versa especially when it comes to a part of a day.

(d) Central tendencies, especially the calculation of the mean value,should be taught using the reverse calculation method when values are omitted and the mean is given.

(e) Learners should be taught that probability cannot be written as a ratio.

(f) Teachers should teach learners how to reason when working with a box and whisker plots and not only how to read from it. Learners miss the point that quartiles divide the data into four equal groupings containing 25% of the data in each group. This means that there are an equal number of data values in each group. An interquartile range then becomes the measure of the spread of a group of values equal to the difference between the upper limit for the lower quarter and the lower limit for the upper quarter.

QUESTION 4:
ANALYSIS OF ELEVATION MAP; MAP OF A ZOO; ANALYSING OF DATA ON VISITING TIMES TO THE ZOO

This question was fairto the candidates. The average percentage performance in this question was 42%.

Common errors and misconceptions

(a) Some candidates failed to recognise that 26,21875 miles in Q4.1.1 can be separated into (26 + 0,21875) miles of which 0,21875 miles can be equated to 385 yards. Instead, they wrote 26 miles + 385 yards = 411. There are candidates who still struggle with the concept of conversion as they do not know when to divide or multiply.

(b) Candidates who chose the incorrect marathon to respond to in Q4.1.2 and Q4.1.4 may not have read with understanding.

(c) In Q4.1.3, many candidates were able to identify the 700 feet and did not convert it to metres as per instruction. Some candidates appeared not to understand what 'height above sea level' meant as they did not indicate any value in Q4.1.3 or give a suitable reason for the difficulty of the marathon in Q4.1.4.

(d) Candidates based their response to Q4.1.4 on the general knowledge about marathons rather than relating it to the elevation map.

(e) In Q4.2.1, candidates who analysed the layout of the zooin a hurry, missed adding up the number of times the two venues appeared and only wrote down their response based on one venue.

(f) In Q 4.2.2 the orientation was changed where North faced downwards and hence some candidates could not identify where the westerly direction was on the layout plan.

(g) In Q4.2.3, candidates found it difficult to work with irregular shapes while others mistook the question to be relating to scale where the ratio of the elephant enclosure was related to that of the entire zoo instead of estimating how many times bigger the zoo was in relationship to the elephant enclosure.

(h) Some candidates used the layout plan instead of the map in order to respond to Q4.2.4. Those who used the map were not able to simplify the bar scale which should have been measured to indicate that2cm: 200m.

(i) In Q4.3.2, some candidates answered the question

(j) The candidate's command of the language was a challenge in Q4.1.4, Q4.3.3 and Q4.3.4 as they were not able to express themselves in order to give correct responses.

Suggestions for improvement

(a) Learners should be taught how to interpret questions in order to understand what response is required,for example in Q4.2.4,candidates were required to measure the distance on the map in mm and then use 200m = 20mm to verify if 85 mm = 1,6 km.

(b) Teachers should provide learners with more complex graphs where different pieces of information can be compared in order to make sound decisions.

(c) Teachers should teach learners how to estimate, especially when working with plans where no scale is given.

(d) Learners should be given compound bar graphs to interpretunder the guidance of the teacherin order to develop the skill of making sound decisions from complex graphs.

CHAPTER 11: MATHEMATICS

The following should be read in conjunction with the Mathematics question papers of the November 2016 Examination.

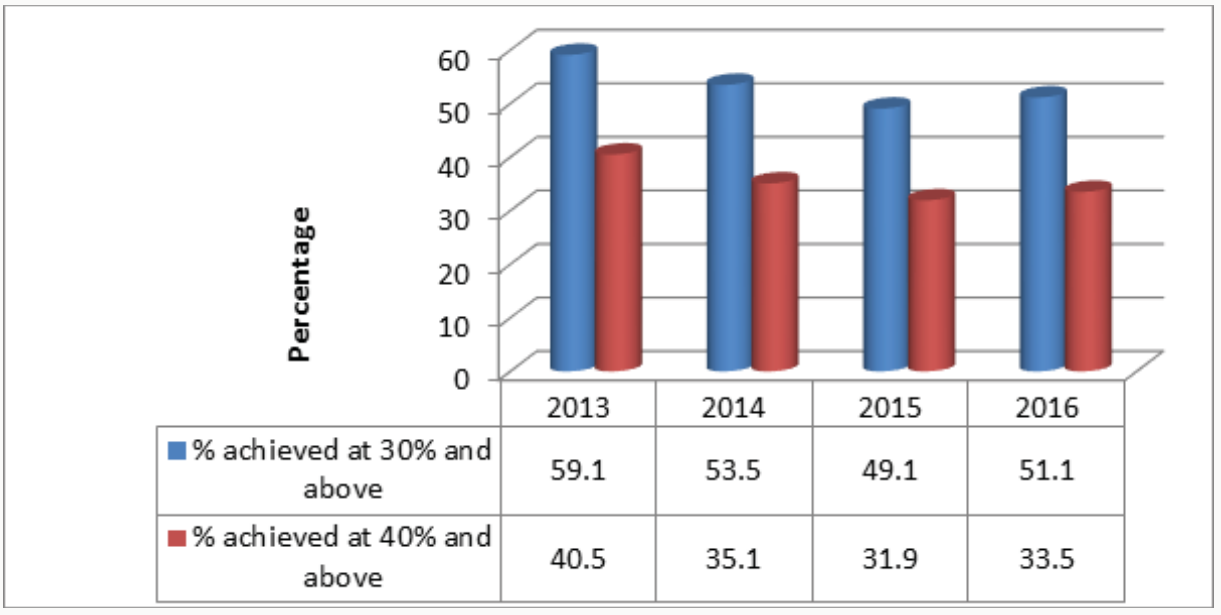
11.1. PERFORMANCE TRENDS (2013 – 2016)

The number of candidates increased by 2 009 in comparison to that of 2015. The general performance of candidates improved this year as indicated by 51,1% of candidates achieving at 30% and above, with 33,5% achieving at 40% and above.

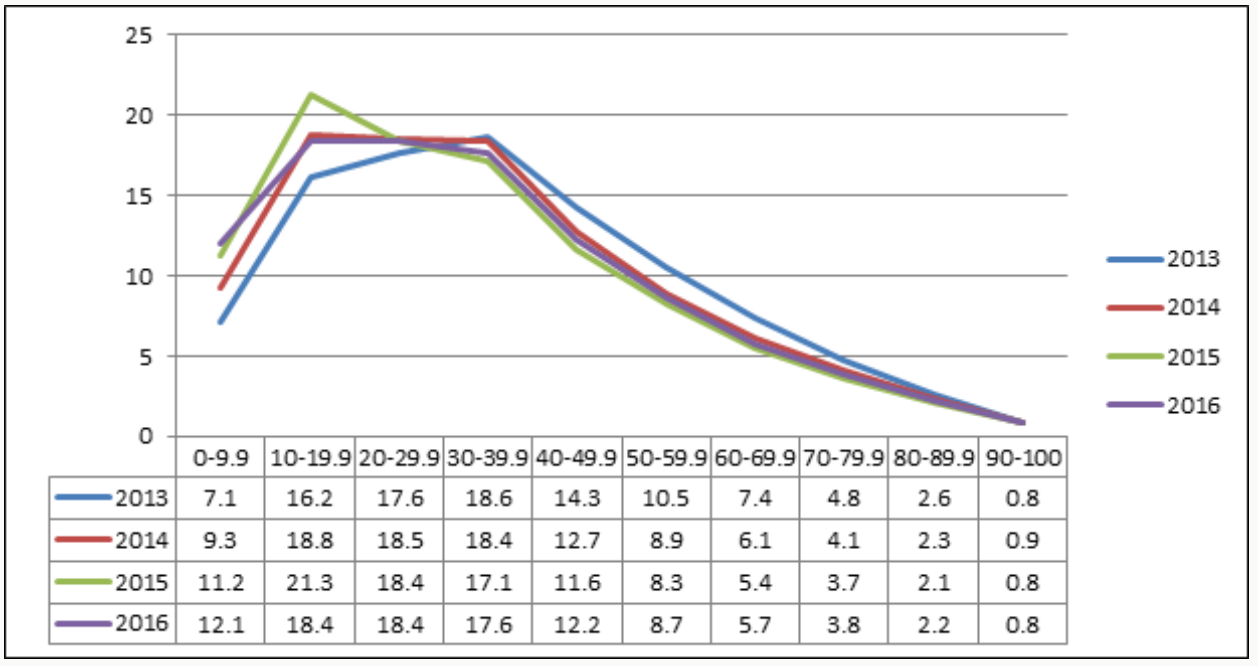
Table 11.1: Overall achievement rates In Mathematics

Year	No Wrote	No. achieved at 30% and above	% achieved at 30% and above	No. achieved at 40% and above	% achieved at 40% and above
2013	241 509	142 666	59,1	97 790	40,5
2014	225 458	120 523	53,5	79 050	35,1
2015	263 903	129 481	49,1	84 297	31,9
2016	265 810	135 958	51,1	89 084	33,5

Graph 11.1.1: Overall achievement rates in Mathematics



Graph 11.1.2: Overall achievement rates In Mathematics



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	7.1	16.2	17.6	18.6	14.3	10.5	7.4	4.8	2.6	0.8
2014	9.3	18.8	18.5	18.4	12.7	8.9	6.1	4.1	2.3	0.9
2015	11.2	21.3	18.4	17.1	11.6	8.3	5.4	3.7	2.1	0.8
2016	12.1	18.4	18.4	17.6	12.2	8.7	5.7	3.8	2.2	0.8

From the above graphs, it is evident that performance in 2016 was marginally better than that of 2015. A reasonable decline in the percentage of candidates who scored between 10 – 19,9% is observed.

11.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

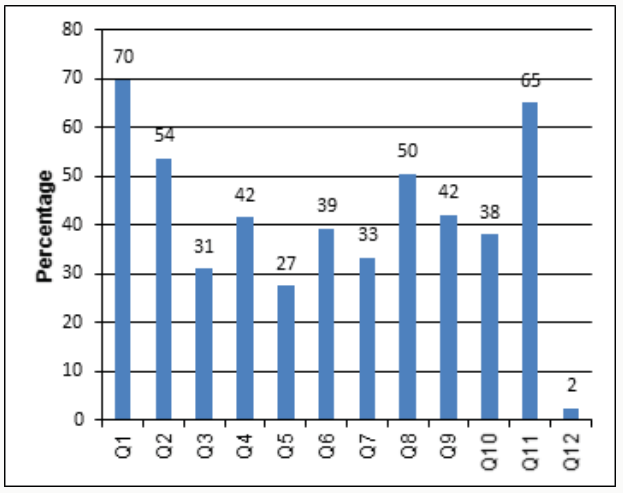
(a) The responses to the questions were better than in previous years. It was evident from the marking process that more candidates managed to pass and get some marks in the majority of the questions.

(b) The algebraic skills of the candidates are poor.Most candidates lacked fundamental and basic mathematical competencies which could have been acquired in the lower grades.

11.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

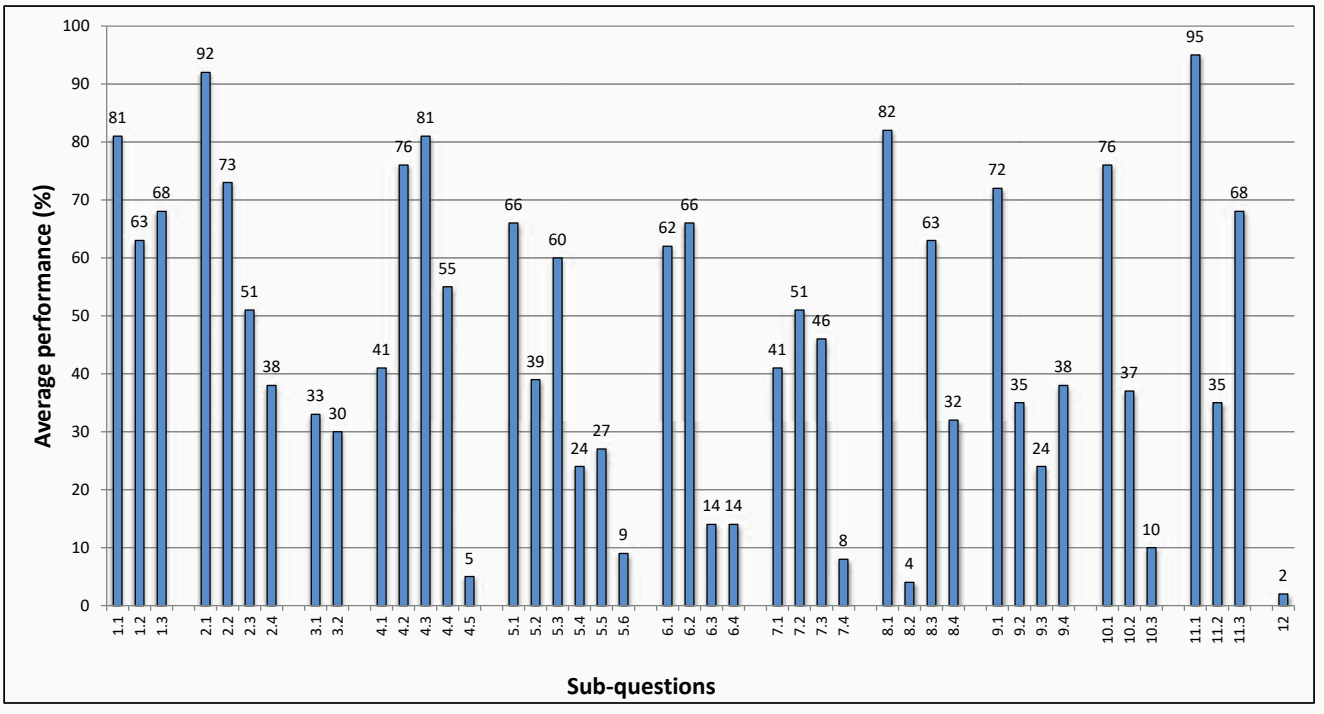
The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Figure 11.3.1 Average percentage performance per question for Paper 1



Q1	Equations, Inequalities and Algebraic Manipulation
Q2	Number Patterns & Sequences
Q3	Number Patterns & Sequences
Q4	Functions and Graphs
Q5	Functions and Graphs
Q6	Functions and Graphs
Q7	Finance
Q8	Calculus
Q9	Calculus
Q10	Calculus – Applications in optimisation
Q11	Probability
Q12	Counting Principles

Figure 11.3.2 Average percentage performance per sub-question for Paper 1



11.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

QUESTION 1: ALGEBRA

This question was generally well-answered, except for Q1.1.3 (solving a surd equation) and Q1.1.4 (exponential equation).

Common errors and misconceptions

(a) Writing down the quadratic formula correctly and correct substitution therein remain problematic among candidates.

(b) In Q1.1.3, candidates did not isolate the square root term before squaring both sides of the equation. They omitted the middle term when squaring the binomial. The majority of the candidatesdid check their answers, but due to their incorrect working they ended up discarding a valid answer. Some candidates confused the concepts of square root and squaring.

(c) Candidates showed little understanding of an inequality and many treated an inequality as an equation. This led to them writing answers that do not make sense. Candidates also showed little or no understanding of set builder or interval notation.

(d) The inequality signs < and >mean very little to the candidates and they could not use them to describe domain, range and certain restricted values on graphs.Incorrect use of inequality signs is problematic, for example: $-7 < x > 1$.

(e) The use of the words 'and' and 'or'are not understood.

Suggestions for improvement

(a) Exponential laws should be fully revised and revisited throughout a learner's high school career. More challenging examples on application of exponential laws should be practised regularly.Algebraic skills need to be improved, especially in Grades 10 and 11.

(b) Teachers should teach factorisation intensively. Provide opportunities for learners to develop their own equations and allow them to factorise those equations on their own. Writing a quadratic equation in standard form means to make the RHS of the equation equal to 0.

(c) Teachers must emphasise that implicit restrictions are placed on surdequations and learners should continue to test whether their answers satisfy the original equation. Learners must master this concept in Grade 11.

(d) In teaching inequalities, integrate Algebra with Functions so that learners have a visual understanding of inequalities.Stress the meaning of the inequality signs in the teaching of both Algebra and Functions. Demonstrate different methods to solve inequality problems so the learners can choose the method which they understand best.

(e) Revisit the rules for simplifyingbasic fractions throughout the Grade 12 year.

(f) Rounding off should be clearly understood by learners and rounding off instructions should be emphasised in class based assessments. Teachers are advised not to condone errors due to rounding

in school based assessment tasks.

QUESTION 2: PATTERNS

Q2.1 toQ2.3 were generally well answered, however Q2.4 was more complex and posed a problem to most of the learners.

Common errors and misconceptions

(a) Many candidateseither did not understand the idea of negative valued terms or chose to ignore this in their calculations.

(b) Candidates did not know how to isolate the sequence which was exactly divisible by 5 from the original sequence.

Suggestions for improvement

(a) While teaching this section, teachers should emphasise the difference between the *position* and the *value* of a term in a sequence.

(b) The first thing learners need to do when given a question is to analyse the type of sequence they are working with and which formulae are applicable to it.

(c) Teachers need to expose learners to patterns where other patterns need to be created within the given pattern. Teachers are encouraged to formulate their own questions and include them in their informal and formal tasks. This will encourage learners to think logically.

(d) Teachers should use the correct notation and mathematical language on a daily basis in the classroom. Encourage learners to speak the mathematical language in the classroom. Teachers also need to realise that learner's understanding of the concepts is more important than them merely doing routine proceduresin the section.

QUESTION 3: PATTERNS

Q3.1.1 and Q3.2.1 were fairly well answered while Q3.1.2 and Q3.2.2 were poorly answered. It would seem that the challenge in answering Q3.1.2 and Q3.2.2 lie in reading rather than in Mathematics.

Common errors and misconceptions

(a) Many candidates struggled to determine the first differences in terms of x and this impacted on the determination of the second differences. The omission of bracketsin Q3.1 led to $3-x-x+1=x+5-3-x$ resulting in incorrect simplification and an incorrect value for x.

(b) In Q3.1.2 and Q3.2.2, many candidates struggled with the wording of the problems. The candidates' responses demonstrated that there was little understanding of the question.

Suggestions for improvement

(a) Attention needs to be paid to the basics in Mathematics: this includes being able to substitute correctly and apply algebraic skills correctly.

(b) Theory plays an integral part in sequences and series. Learners should be taught to distinguish between the formulae so that they may select the appropriate one to answer the question. The teaching of the theory will also assist learners in being able to answer questions where the value of a term is unknown and they are required to calculate it.

(c) Challenge learners in teaching and assessments by using different types of problems, including sequences that have negative values, fractions and word type problems.

(d) Expose learners to 'unseen' type questions where unfamiliar patterns are formed. Convince them that these are generally easy to solve.

(e) Teachers should consult the array of different questions in sequences, as tested in the last 9 years. Contextual examples where reading is required should be emphasised.

QUESTION 4:
FUNCTIONS (EXPONENTIAL)

With the exception of Q4.5, this question was reasonably well answered.

Common errors and misconceptions

(a) Candidates identified the asymptote of 0, but commonly wrote the asymptote as $q = 0$ or horizontal asymptote = 0 or just 0. Candidates who mistook this function to be a hyperbola, gave both asymptotes.

(b) Many candidates incorrectly assumed that $b = -2$ in Q4.4 and did not engage in the formula obtained in Q4.3.

(c) Q4.5 was a higher order question that involved a transformation of the graph to obtain the answer. This was poorly understood by most candidates.

Suggestions for improvement

(a) Learners should understand the difference between the equations of the various graphs.

(b) Algebraic manipulation and theory should be an integral part of every lesson.

(c) Emphasise the drawing of graphs as well as the interpretation of functions.

(d) It is important for teachers to emphasise that learners must do thorough revision of Grade 11 work in Functions. Learners have to know and understand the basic shapes, properties etc. of each type of graph very well before they can go on to more difficult questions.

(e) The Examination Guideline specifies that "Nature of roots will be tested in all the prescribed functions". Teachers need to include this in their teaching of Functions and Graphs.

(e) Transformations should be incorporated into functions. Transformations should be seen in the light of the effects on the parameters a, p and q in the equation.

QUESTION 5:
FUNCTIONS (PARABOLA AND HYPERBOLA)

This question was very poorly answered. Many candidates did not understand the given format of the hyperbola equation.

Common errors and misconceptions

(a) Candidates assumed that B(2; 1) was a point on the graph in attempting toanswer Q5.1 instead of showing how the coordinates could be calculated.

(b) Candidates struggled to give the proper inequality for the range in Q5.2. They did not recognise that point B(2; 1) had to be used.

(c) Candidates struggled with the notation of the inequality to represent the required domain. Common errors in notation were: $[1; -\infty)$ or $-1 \geq x \geq 2$.

(d) Candidates misinterpreted the notation g(x+4) in Q5.4 and translated the graph four units to the right. Candidates also resorted to the algebraic approach and could not solve the resulting equation. As emphasised in Q4.5, there is clearly a lack of understanding in obtaining a solution from a transformed graph.

(e) The unusual form for the equation of the hyperbola was problematic for many candidates in this question. As a result, they confused the signs of p and t.

(f) Candidates found difficulty in interpreting the product inequality in Q5.6. In addition, the product involved the function f and the gradient of g. The idea that $g'(x)$ was always negative was misunderstood by the majority of the candidates.

Suggestions for improvement

(a) Teachers should emphasise the properties of functions and thevarious forms of the equations that they can be represented in.

(b) Teachers must emphasise that when proving a given expression, the given information cannot be assumed. When answering questions that start with “Show that …” or “Prove that …”, learners are required to perform the necessary calculations and show that the final answer of their working is the same as the given expression.

(c) More time must be spent on the meaning of inequalities, what they represent and also how to write a domain or range in the correct notation. This includes the emphasis on interval notation and using the inequality signs to represent the same interval.

(d) Learners need to understand what the derivative of a function actually is and how to answer interpretative questions based on the derivative, the function and a combination of these two.

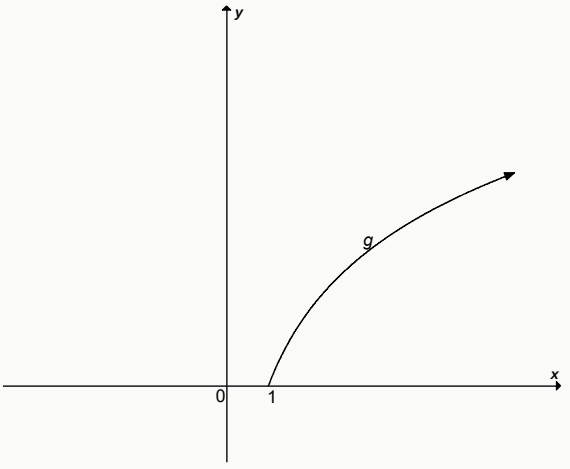
QUESTION 6:
FUNCTIONS (STRAIGHT LINE AND EXPONENTIAL FUNCTION)

Q6.1 and Q6.2 were generally better answered than Q6.3 and Q6.4.

Common errors and misconceptions

(a) The candidates did not indicate the intercepts on the axes for the straight line graph, nor did they draw the graph with a ruler. Many responses for the straight line graph were given as curved functions.

(b) Many candidates were unable to draw the log graph correctly. Whilst they used their calculators to determine points to plot, they consequently drew the following wrong graph:



(c) Candidates are more familiar with being given the exponential function and asked to determine the inverse of this function rather than being given the logarithmic function and to determine its inverse. Common errors in candidate's answers were:

$x = \log_2 y$ or $y = \dfrac{x}{\log 2}$ $\quad$ $x = \log_2 y$ or $y = x^2$ $\quad$ $x = \log_2 y$ or $y = 2x$

(d) Many candidates failed to make the connection between Q6.1 and Q6.2 in determining the solution to this question. This, once again, illustrated the difficulty candidates have in obtaining a solution graphically. Candidates also struggled to explain their solution in mathematical language. They did not use the correct terminology of reflection, translation about a line and determining the point of intersection.

Suggestions for improvement

(a) Teachers should spend enough time on graphs in Grade 11 to ensure that basic concepts are understood.

(b) Transformations (specifically symmetry and reflection) should be tested regularly in the graphs section.

(c) Do not use the calculator as the main teaching tool to sketch graphs. Instead, the focus should be on the critical values on the graph.

(d) Pay attention to linking the shape of the graph to the equation of the function.

(e) Emphasise the properties of functions such as: intercepts with the axes, axes of symmetry, asymptotes,

turning points and concavity.

(f) Inverses of all graphs need to be considered and learners should be taught to comfortably interchange between the original and the inverse and vice-versa. Learners must be able to comfortably interchange between an exponential and logarithmic function as well as the logarithmic function and the exponential function. This also applies to the inverse of a parabola and the parabola.

(g) Learners need to be taught to explain the mathematical manipulations. Informal assessments open up opportunities for this.

(h) Expose learners to a number of ways that functions can be tested. Analysis of functions need to be such that there is an understanding of the meaning of certain calculations and not just the basics of functions.

QUESTION 7: FINANCE

This question was generally poorly answered.

Common errors and misconceptions

(a) Many candidates made mistakes in calculating the number of months,*n*. Common incorrect values were $n = 1$ and $n = 3$. Some even used $n = 12$, 24, etc. as if they converted years to months. The fact that candidates used the wrong number of months also indicates that they did not realise that there is always a one month "gap" before the first instalment on the loan is paid.

(b) Many candidates could not calculate the value of i correctly. Some used or $i = 0{,}15$ $i = \frac{0{,}15}{46}$, etc.

(c) Candidates treated Q7.1 and Q7.2 independently from each other. Many did not realise that the questions followed on from each other.

(d) Candidates were unable to manipulate the equation correctly to calculate n. Many candidates ended up with the log of a negative number but then just got rid of the negative number to arrive at an answer on their calculators.

(e) Some candidates did not realise that an answer of n = 35,42 meant that there would be 36 instalments that would need to be paid (35 instalments of R9 000 and 1 less than R9 000).

Suggestions for improvement

(a) Spend time teaching learners to interrogate what they are doing. Finance should be taught with more insight. It is not merely the substitution of values into a formula.

(b) Teach the correct use of calculators in order to prevent step-by-step answers which result in inaccurate final answers. It should be standard practice in the classroom for learners to round correctly to two decimal places in Financial Mathematics.

(c) Basic algebraic rules such as multiplication and exponential laws should be taught properly in earlier grades and revised continuously in Grades 11 and 12.

(d) Remind learners that they must also count the first payment when calculating the total number of payments. In this question, learners would have been able to determine the correct n if calculated as 48 – 13 +1 = 36, asa payment was made in the 13th month as well. It is important to use a timeline to show learners when the payments will be made, especially referring to deferred payments. The timeline shows the learners how many payments will be 'skipped'.

(e) Teachers should reinforce when to use the future or present value formula. Learners should do many examples in context in order to deepen their understanding of the different problems as well as the language associated with financial questions.

Teachers should use the correct language in class and in assessment tasks.

(f) Deferred payments are part of the syllabus and must be taught. Not all textbooks cover this concept and some textbooks show this topic as extension or non-examinable. Teachers must use a wide range of resources to enhance the learners' experience in the classroom.

QUESTION 8: CALCULUS

Q8.1 and Q8.3 were well answered.

Common errors and misconceptions

(a) Although first principles are taught and reiterated in class, candidates still had a problem with notation in this question. The following errors keep occurring:

(i) Algebraic errors such as incorrect expansion, adding unlike terms and changing of signs in multiplication.

(ii) Incorrect use of the formula as well as notational mistakes.

(iii) Omitting the factorisation step of the working.

(b) Candidates were unable to determine the function used in Q8.2 and the corresponding a-value.

(c) In Q8.3, some candidates got rid of the square root in the first term by simply squaring the term, not realizing that they are not just re-writing but changing the function they are working with. Notation in

this question was a problem as candidates gave the derivative as $\frac{dx}{dy}$.

(d) Q8.4 was well attempted by candidates but they did not execute the algebraic manipulation correctly.

Suggestions for improvement

(a) Teachers should stress the importance of correct notation when answering a first principles question. It seems as if learners handled this question better when they simplified $f(x+h)-f(x)$ or even the fraction $\frac{f(x+h)-f(x)}{h}$ first and then applied the limit as $h \to 0$ to the simplified fraction.

(b) Basic algebraic manipulation in earlier grades should be taught properly and revised on an on-going basis.

(c) The drill and practise exercises for determining the derivative from first principles and applying the rules of differentiation are necessary. The original function must be in the differentiable form (that is, in terms of where one can correctly identify the coefficient, variable and exponent) before the rules of differentiation can be applied.

(d) Fractions and exponential laws should be emphasised when working with Calculus.

(e) The language of Calculus must be taught and used correctly in the classroom at all times.

QUESTION 9:
CALCULUS (GRAPHICAL APPLICATION)

This question was poorly answered except for Q9.1.

Common errors and misconceptions

(a) Candidates did not realise that the stationary points are the turning points of the function.

(b) The concept of concavity and the interval for which a function is concave up or concave down on is not understood well by candidates.

(c) Candidates had problems representing the interval for which the function was increasing.

Suggestions for improvement

(a) In teaching any function, teachers should expose learners to all aspects of the function. This includes sketching, interpretation of the equation and the graph, as well as finding the equation from given information and transformations. The teaching should also include concepts such as roots, points of intersection, intervals where graphs are relative to one another under a given condition, gradients and equations of tangents.

(b) Learners should be taught to distinguish between the function and its gradient, in other words, the difference between the meanings of $f(x)$ and $f'(x)$.

(c) Expose learners to higher order thinking questions and interpretation of graphs. Initially teachers should assist learners in understanding what is being asked, what it looks like on the picture and which *x*-values are relevant to the interval required in the solution.

(d) Teachers must be aware that concavity of functions is explicitly mentioned in CAPS. It is important

for teachers to discuss the concepts of concave up, concave down and the intervals for which these occur. The concavity of a graph should also be linked to the second derivative. If a function is concave up on an interval then $f''(x) > 0$ and if a function is concave down on an interval then $f''(x) < 0$.

(e) In a cubic graph, the concavity always changes at the point of inflection. This, however, is not true for all functions, for example $f(x) = x^4$. It is therefore necessary that learners must demonstrate the difference in concavity on either side of the point of inflection (the change of sign in the second derivative).

(f) The cubic function in relation to its first and second derivatives or the quadratic function in relation to its first derivative needs to be taught with great insight. Learners who understood the connection between the function, the first derivative and the second derivative answered this question well.

QUESTION 10: CALCULUS (APPLICATION)

This question was well answered except for Q10.3.

Common errors and misconceptions

(a) Many candidates did not see the connections amongst rate of change,gradient and derivative. Hence, in Q10.3, it was evident that candidates did not link maximum rateof change to the second derivative being equal to zero.

(b) Many candidates determined M′(t), equated it to zero and then solved for t, as is often required in optimisation questions and not realising that this was not the question in this case in Q10.2.

Suggestions for improvement

(a) Learners should be exposed to the integration of topics across papers.

(b) More emphasis needs to be placed on 'rates of change' and what is meant by this term.

(c) The section on measurement/mensuration is taught in Grade 10 and revision should take place in Grades 11 and 12. Make use of models/teaching aids to assist in the teaching of this section.

(d) Expose learners to examples where they have to differentiate with respect to variables other than x.

(e) This section of Calculus is often taught towards the end of the year and therefore learners do not get enough opportunity to practise. Teachers should ensure that there is enough time for learners to understand the application fully.

QUESTION 11: PROBABILITY

Q11.1 and Q11.3.1 were very well answered whereas Q11.2 and Q11.3.2 were poorly answered.

Common errors and misconceptions

(a) Candidates were unable to explain their understanding in Q11.2. They often contradicted themselves in their answer.

(b) Candidates assumed that the events in Q11.3.2 were independent and used this in their calculations.

Suggestions for improvement

(a) The terminology needs to be explained in greater depth.

Terminology	Meaning	Rule
Mutually exclusive	Events that cannot take place at the same time. There is NO intersection between the events on a Venn diagram	• $P(A \text{ or } B) = P(A) + P(B)$ • $P(A \text{ and } B) = 0$
Independent events	The outcome of the first event does NOT influence the outcome of the second event	• $P(A \text{ and } B) = P(A) \times P(B)$ • $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

QUESTION 12: COUNTING PRINCIPLE

This question was extremely poorly answered.

Common errors and misconceptions

(a) The language in this question could have been a barrier to the candidates.

Suggestions for improvement

(a) The section on the Fundamental Counting Principle needs to be taught as clearly and simply as possible, steering away from formulaebut rather just reasoning out scenarios, using diagrams where needed.

(b) In some cases, teachers still need assistance to improve their own content knowledge in probability. Follow-up workshops for this purpose in the coming year could help in this regard.

11.5 OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

(a) It was pleasing to note that there were fewer candidates who did not attempt certain questions. As there was opportunity for candidates to score marks in every question, this translated into better performance in this paper.

(b) The Level 4 questions were really challenging. However, many candidates attempted to find solutions to these questions. This is very encouraging as it shows that candidates do enjoy being challenged.

(c) Some topics are still posing a challenge. Overall, it would seem that the abstract nature of Trigonometry is seen as a deterrent for candidates to engage with this section. The response to Euclidean Geometry is mixed: whereas some candidates are able to attempt this section with a degree of competence other candidates are not attempting these questions.

(d) The integration of topics proved to be a challenge to many candidates. It must be understood that Mathematics cannot be studied in compartments.

(e) It is evident that many of the errors made by candidates in answering this paper have their origins in a poor understanding of the basics and foundational competencies taught in the earlier grades. These include:the inability to make the relationship between angle of inclination and gradient; a lack of knowledge that a trigonometric ratio is equal to some numeric value;the poor recall of reduction formulae and trigonometric identities; the inability to relate angles in a diagram and the inability to provide justification for statements.

(f) Candidates struggled with concepts in the curriculum that required deeper conceptual understanding. Questions where candidates had to interpret information or provide justification, presented the greatest challenge.

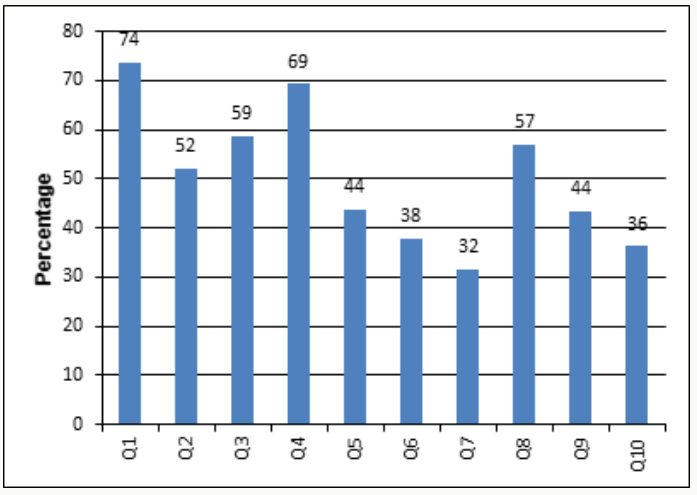
(g) A number of candidates lacked the necessary insight to deal with questions based on compound angles, interpretative questions on trigonometric functions and complex questions in Euclidean Geometry. Many candidates did not answer Question 10 or they made a poor attempt at it.

(h) In general, candidates need to exercise caution with algebraic manipulation skills since overlooking certain basic principles or practices results in the unnecessary loss of marks. Although the calculator is an effective and necessary tool in Mathematics, learners appear to believe that the calculator provides the answer to all their problems. Some candidates need to realise that conceptual development and algebraic manipulation are often impeded as a result of the dependence on the calculator.

11.5. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

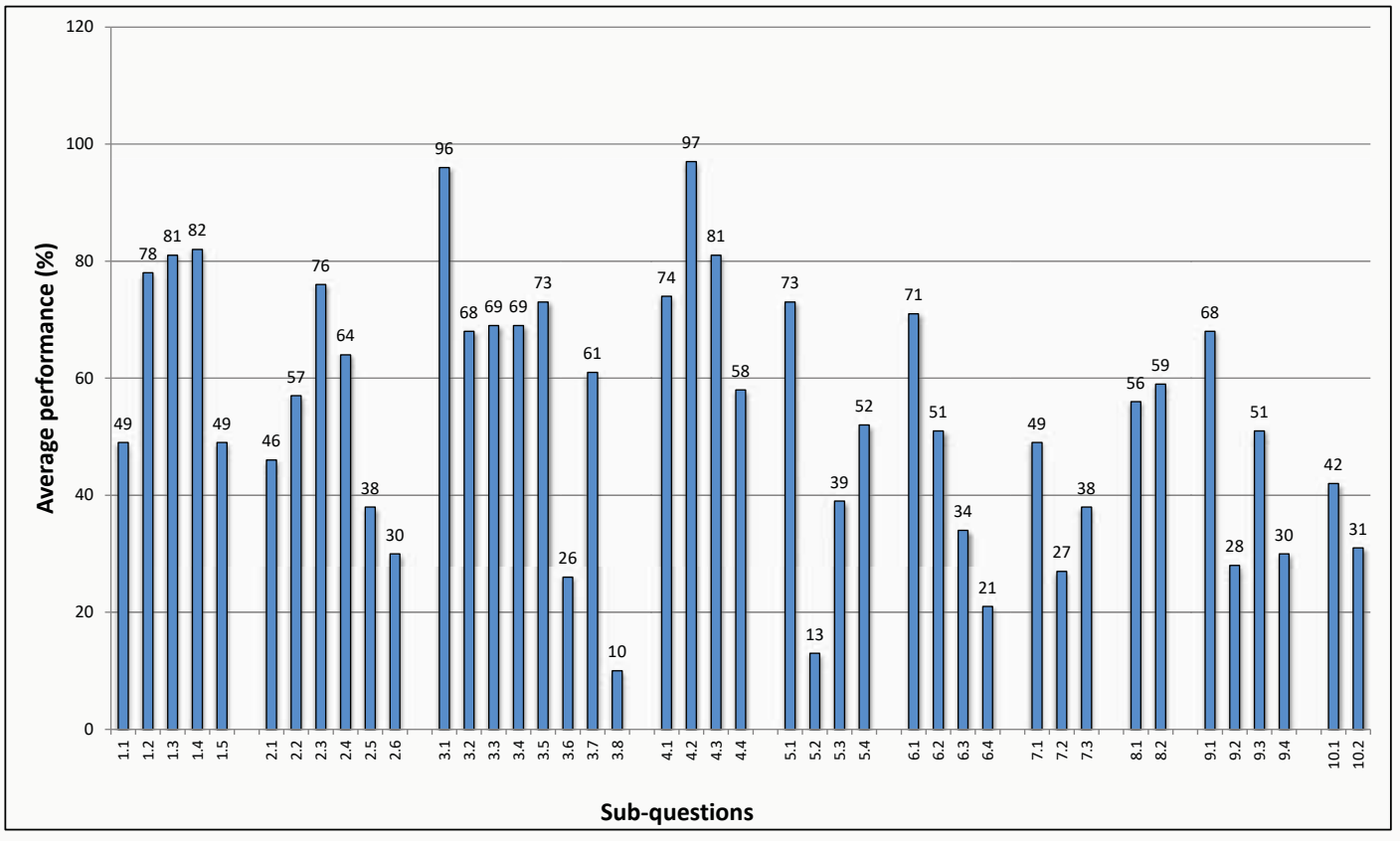
The following graph was based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Figure 11.6. Average percentage performance per question for Paper 2



Q1	Data Handling
Q2	Data Handling
Q3	Analytical Geometry
Q4	Analytical Geometry
Q5	Trigonometry
Q6	Trigonometry
Q7	Trigonometry
Q8	Euclidean Geometry
Q9	Euclidean Geometry
Q10	Euclidean Geometry

Figure 11.6.2 Average percentage performance per sub-question for Paper 2



11.7 ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

QUESTION 1: DATA HANDLING

This question was answered fairly well by most of the candidates. It was noted that the calculator skills of many candidates has shown improvement. Some candidates still show poor or limited use of the calculator and these candidates struggled to answer this question. It was disappointing to note that candidates are unable to round off their answers correctly.

Common errors and misconceptions

(a) In Q1.1, many candidates could correctly comment on the strength of the relationship. Others merely stated the trend of the data but this was not required. Some associated the negative slope of the data as having a weak relationship between the variables.

(b) A large number of the candidates were able to calculate the correlation coefficient. Many candidates rounded the answer incorrectly. Some omitted the negative sign in the answer.

(c) In Q1.4, many candidates were able to calculate the values of a and b correctly but then interchanged these values in the equation $y = a + bx$. They confused the form of the least squares equation with that of a straight line $y = ax + b$. Again, a fair number of candidates made errors when rounding.

(d) In the main, many candidates were able to answer Q1.4 correctly. Some substituted 6 for y instead of x. They did not realise that the 6km mentioned related to the x-variable.

(e) Many candidates are still unable to draw the least squares regression line. Instead, they drew the line of best fit. It would seem that candidates cannot relate the least squares equation to the least squares regression line. Some candidates drew a frequency polygon or even a bar graph.

Suggestions for improvement

(a) Data Handlingis a section of work in which learners can score maximum marks. A concerted effort should therefore be made to ensure that learners understand this topic. It should not be relegated to a rushed job at the end of the year.

(b) Teachers should explain the different concepts that learners will encounter in this topic. Poor understanding of these concepts is a contributing factor to learners' confusion.

(c) The use of the calculator should be taught through demonstration. A calculator emulator is a useful tool for demonstrating the use of a calculator. Learners should be given multiple opportunities to then practice these skills. Learners need to be made aware that the operation procedure varies from one brand of calculator to the next. It is in their interest to use the same brand regularly.

(d) Learners should know the difference between *trend* and *strength of the relationship between the variables*. They are two different concepts and cannot be used interchangeably.

(e) Teachers and learners need to be aware that there is a marked difference between the line of best fit

and the least squares regression line. The line of best fit is an intuitive line whereas the least squares regression line is defined by some equation. Therefore, the least squares regression line should be drawn accurately, in the same way as one would draw the graph of any other straight line. It should be noted that the point $(\overline{x};\overline{y})$ will lie on the least squares regression line. This could also be used as a reference point when drawing the required line.

QUESTION 2: DATA HANDLING

Performance in this question ranged from poor to good. The first 9 marks were accessible to most candidates. Candidates had difficulty in relating the data from the histogram to the cumulative frequency table and the ogive.

Common errors and misconceptions

(a) Q2.1 was very poorly answered by most candidates. They had no idea of the concept of skewness in the context of a histogram. Many guessed the answer.

(b) Many candidates did not read this question carefully and just rushed into answering Q2.2. Instead of using the maximum and minimum values given in the introduction, they used the values from the histogram to calculate the range. A number of candidates gave the answer as 2,3 – 1,3 = 1 and a fair number of candidates gave the answer as the difference between the maximum and minimum frequencies, i.e. 71 – 4 = 67. Some confused range in Statistics with range in Functions.

(c) Whilst some candidates were able to complete the cumulative frequency table correctly whilst others had no idea how to do this. These candidates were unable to link the number of learners in the histogram with the frequencies in the table. Some candidates were under the impression that frequency and cumulative frequency meant the same thing.

(d) Candidates who could not complete the cumulative frequency table were unable to answer Q2.4. It was disappointing to note that a number of candidates are still unable to draw an ogive correctly. A large number of them are still plotting against either the midpoint or lower boundary of the class intervals. They are also not grounding the ogive at the lower boundary of the first class interval. Many are using a ruler to join the points rather than drawing a smooth freehand curve. Some candidates are plotting against the frequency of each class interval. Learners are expected to perform well as this type of questionappear in the examination papers frequently.

(e) Q2.5 was poorly answered. It would seem that the challenge in this question lies in the reading. Candidates could not interpret 'eighty' as 80. Those who overcame this challenge did not indicate on the graph how they arrived at their answer.

(f) Many candidates found Q2.6 to be too wordy and hence very few attempted it. Some of them misunderstood the question and responded with a calculation as the answer instead of an interpretation.

Suggestions for improvement

(a) The information in this question was presented differently but it tested familiar concepts. The response from the candidates was therefore surprising. It would seem that if information is presented differently, then candidates do not have a point of reference from which to start answering. Exposing learners to a variety of questions should rectify this shortcoming.

(b) Teachers must use correct statistical vocabulary and terminology. These concepts must be explained in detail before using them in order for learners to relate to them.

(c) Learners should be taught to identify skewness from a wide variety of contexts and not exclusively through the box-and-whisker diagram. An interesting exercise is to use the ogive to draw a box-and-whisker diagram and from it ascertain the skewness of the data set. In this way, learners would be able to identify skewness in a histogram far more easily.

(d) An ogive is a graphical representation of the cumulative frequency table. It shows the total number of observations in a data set that are less than or equal to the upper boundary for each class interval. Hence we plot against the upper boundary of each class interval. We ground the ogive to indicate that there are no values in the data set that are lower than the lower boundary of the first class interval.

(e) Learners should be exposed to real life scenarios in Data Handling. Exposure to questions of an interpretive nature cannot be over-emphasised. This should form an integral part of the teaching and learning of this topic. Learners are encouraged to answer different types of questions in data handling to improve their performance.

QUESTION 3:
ANALYTICAL GEOMETRY

This question was well answered as the Level 1 and Level 2 questions (Q3.1 to Q3.5) were accessible to most candidates. However, many candidates made basic errors with signs and computation. It is unacceptable that candidates should write a formula that is already given to them in the information sheet, incorrectly. Candidates did not do well in the rest of the questions which were of higher order.

Common errors and misconceptions

(a) Most candidates recognised M as the midpoint of AC. Some candidates made errors with the signs in the midpoint formula or they substituted incorrectly into the formula.

(b) In Q3.2, the common errors were: incorrect formula, swapping the values of x and y and incorrect simplification. For example, $m_{BC} = \frac{0-3}{p-6} = \frac{-3}{-6p} = \frac{1}{2p}$. Some candidates stated that the gradient of BC was 2. Whilst this was correct, it was not what the question asked.

(c) Candidates' lack of knowledge of the properties of a rectangle resulted in their inability to answer Q3.3 and Q3.4. They could not recall that AD was parallel to BC and hence the gradient of AD was equal to the gradient of BC. Further they did not state why AC and BD were equal in length.

(d) In Q3.3, some candidates used the equation of AD and point F to determine the value of p. In this instance, they assumed that parallel lines have the same equations.

(e) In Q3.4, many candidates made the assumption that F was the midpoint of BC. Whilst this was indeed the case, the assumption had to be proven before it could be used in calculating the coordinates of B.

(f) Again in Q3.5, candidates failed to link the gradient of BC with that of AD. Some used $\frac{1}{2}$ instead of 2.

(g) A lack of knowledge of Euclidean Geometry and its integration in Analytical Geometry made Q3.6 and Q3.8 particularly challenging. Candidates could not identify the cyclic quadrilateral or quadrilateral in Q3.6. Many assumed that FOGB is a cyclic quadrilateral without first proving it. In Q3.8, many candidates answered yes without providing any motivation. Further, a number of candidates provided the reason as tan-chord theorem instead of converse tan-chord theorem. These candidates were unaware of the difference between a theorem and its converse.

(h) Candidates often referred to many angles as θ, without stating explicitly which angle they were referring to. This resulted in a number of angles having the same name but different values. This only served to confuse candidates even further.

(i) In Q3.7, candidates used the incorrect value of r or r^2. Quite often, this was as a result of ignoring the fact that DB was the diameter of the circle and not the radius. Another common error was that candidates assumed that C was the centre of the circle instead of M.

Suggestions for improvement

(a) To answer Analytical Geometry well, learners should master the properties of quadrilaterals and triangles.

(b) Learners should be encouraged to show all the steps in the working. Continual practice should remedy the basic errors that learners make.

(c) Learners need to realise that when making a statement, they are in fact making a claim. Such claims must be justified. Therefore, learners must provide reasons for statements in Analytical Geometry.

(d) Learners should refrain from making assumptions about features in a question. These need to be proved first before the results can be used in an answer.

(e) The different topics in Mathematics should be integrated. Learners must be able to establish the connection between Euclidean Geometry and Analytical Geometry. In this regard, it is advisable for teachers to revise the properties of triangles and quadrilaterals before commencing with teaching Analytical Geometry.

(f) The answers to some questions might seem trivial and learners are tempted to write down the answer only. However, there is high-powered reasoning behind this so-called trivial solution. Learners should show that they understand the high-powered reasoning in their answers and not because it happens to be so. Learners must show all their workings, especially where the answer requires more than one step of working.

QUESTION 4:
ANALYTICAL GEOMETRY

This was one of the better answered questions in the paper.

Common errors and misconceptions

(a) Whilst many candidates were able to answer Q4.1 correctly, many provided the incorrect reason. It is evident that language is still a major challenge as some candidates used inappropriate words in their reason: chord instead of diameter and facing instead of subtends.

(b) Candidates made very basic errors in answering Q4.2. Some swapped the x and y values in the formula. A number of candidates failed to simplify correctly.

(c) Candidates did not realise that TS was perpendicular to SR. They confused perpendicular lines with parallel lines in Q4.3. Consequently, many used the gradient of $-\frac{5}{2}$ instead of $\frac{2}{5}$ in their calculations.

(d) In Q4.4.1, many candidates took r instead of r^2 to be $36\frac{1}{4}$. A number of candidates calculated the length of TM correctly but failed to use the fact that TR = 2 TM to calculate the final answer. Other candidates calculated and substituted the coordinates of T and M into the formula but called this distance TR. Some candidates first calculated the coordinates R and then correctly calculated the length of TR. This was very time consuming method of solving a 2 mark question.

(e) Some candidates made incorrect substitutions into the midpoint formula when answering Q4.4.2. It is of concern that candidates simplified $6\frac{1}{2}$ as 3. This shows that they have little understanding of a mixed number.

(f) A large number of candidates failed to realise that TSR was a right-angled triangle and that the question could be answered using basic trigonometric definitions. A number of candidates calculated the length of ST but could go no further; others selected incorrect sides in their attempt to determine sin R. Some candidates went on to calculate the size of angle R even though this was not required.

(g) In Q4.4.4, many candidates did not realise that TR was perpendicular to LK. Many assumed that TK = TR. Some started with b = 12a – 29, substituted T(3 ; 7) and concluded that LHS = RHS. They were not awarded any marks for this as it did not answer the question. Candidates had difficulty in associating variable a as x and variable b as y in the equation.

(h) Many candidates struggled with this question. They did not link Q4.4.1 and Q4.4.4 with Q4.4.5. Hence they did not establish the necessary equations to answer this question. Those who managed to establish the equations were distracted by the large numbers that they encountered in their calculations. Some merely wrote down the coordinates of K without showing any working. Others used the midpoint formula on account of TK = TR.

Suggestions for improvement

(a) Teachers need to revise the concept of perpendicular lines and gradients, in particular that the tangent

is perpendicular to the radius at the point of contact.

(b) Learners must be taught to refrain from assuming facts that are not given. The order in which learners answer questions is important. You cannot use a result that you have not already shown to be true in an answer.

(c) Teachers must not overlook the integration of Euclidean Geometry and Trigonometry in Analytical Geometry. The integration should not only be confined to triangles and quadrilaterals but also extend to circles. Continued exposure to higher order questions will improve the skills of the learners in answering such questions.

(d) In class, learners should be encouraged to explain their strategy briefly when answering higher order questions. Other learners should be asked to point out errors in the explanation and to provide alternate approaches. This collaborative learning strategy should develop the creative thinking skills that are required in solving unseen problems.

QUESTION 5: TRIGONOMETRY

Performance in this question was average.

Common errors and misconceptions

(a) Candidates continue to defy the instruction 'without the use of a calculator'. No marks were awarded if a calculator was used in Q5.1 and Q5.4.

(b) Errors in Q5.1.1 resulted from the incorrect selection and application of reduction formulae. Candidates made errors with the signs in the reduced form of the ratio. The most common errors were: sin 196° = sin(180° + 16°) = sin 16° or sin 196° = sin(180° – 196°) = –sin 16°

(c) Whilst many candidates were able to use the squares identity in attempting to answer Q5.1.2, they made fundamental errors in dealing with the square root. Most common errors were:

$\cos 16^\circ = \sqrt{1+p^2}$ or $\cos 16^\circ = \sqrt{p^2-1}$ or $\cos 16^\circ = \sqrt{1-p}$.

(d) The question on bookwork was poorly answered. Many candidates attempted to introduce co-ratios to the RHS of the given formula. Some started with cos(A – B) = cos[90° – (A – B)]. This shows that little attention is paid to the theory in Trigonometry.

(e) Many candidates failed to identify that $1 - \cos^2 2A$ could have been rewritten as $\sin^2 2A$. Instead they made many unnecessary double angle substitutions. Candidates also had difficulty in dealing with the negative angle and the co-ratios. In an effort to get rid of the square root sign, some simply ignored it as if it was not in the question and others squared the expression without realising that they had now changed the question.

(f) Many candidates failed to use double or compound angle formulae to answer Q5.4. A common response to Q5.4.1 was that $\cos B = \frac{3}{10}$. Candidates confused cos2B with 2cosB. Another common response was that $\cos B = \frac{3}{5}$. From this point, candidates drew the correct sketch and proceeded to determine that $\sin B = \frac{4}{5}$. Although candidates were able to expand Q5.4.3 correctly, they were unable to deal with the values of cosB or sinB, where these were not calculated earlier.

Suggestions for improvement

(a) Learners need to understand that knowledge of theory is integral in answering questions in trigonometry. There is no short-cut to this process. They need to learn the reduction formulae and know which formula to use in the given situation.

(b) Teachers should not only focus on the expansions of the compound angles. They should also expect learners to identify the compound angle from the given expansion.

(c) Learners must be advised to show all steps when working with reduction formulae. Marks are not awarded to candidates who make errors with the signs

(d) Learners must adhere to instructions. When the question states 'without using a calculator', it is expected that they should not use a calculator.

(e) Learners should be advised to draw a sketch to assist in answering questions where they are not allowed to use a calculator.

(f) Learners should justify all their steps. This can only be achieved if teaching is coupled with conceptual understanding.

QUESTION 6: TRIGONOMETRY

This question was poorly answered.

Common errors and misconceptions

(a) Candidates were unable to draw the graph of y = –cos2x correctly. Many struggled with the shape as they were unsure of the location of the turning points. Candidates were careless in plotting the x-intercepts accurately.Some even joined the points with a ruler. Candidates did not observe the domain of the graph and drew arrows at the end of the graph. Candidates did not indicate the co-ordinates of the critical values on the graph.

(b) It is evident that candidates are not aware of the transformations that are applied to the basic trigonometric functions and how these transformations impact on the equation of a trigonometric function. In Q6.2, candidates confused maximum value with range and gave the answer as an interval instead of a single value. Candidates did not realise that the answer they were looking for could be obtained from the y-coordinate of the maximum turning point.

(c) Many candidates could not solve the equation. They used compound angle formulae to expand both sides of the equation and this made the problem far more complicated than it really was. Many candidates resorted to using the calculator to solve the equation but they lost marks for leaving out key details in the working: +k.180° and $k \in Z$. It was rather disappointing that some candidates managed to get to tan2x = $-\frac{1}{2}$ and then selected the incorrect quadrants for the final answer.

(d) Many candidates were able to correctly identify the critical values for the required interval but used the incorrect notation. They included the endpoints when the question required determining the interval for which $f(x) < g(x)$. Some candidates gave answers that were outside the required interval.

Suggestions for improvement

(a) It is common practice for learners to use calculators to sketch graphs. Hence, they do not pay attention to certain critical features of these graphs. Although learners are expected to produce a sketch graph, there is still a high degree of accuracy required of them.

(b) Whilst the point-by-point approach is a valid way to introduce trigonometric graphs, the focus of attention should be on the critical features and characteristics of these graphs. Teachers should also highlight characteristics such as where the graph is increasing, decreasing, above and below the x-axis.

(c) When discussing the transformation of trigonometric graphs, learners must be alerted to how the critical features and characteristics of the basic graph change for each transformation. In this way they will be able to visualise the effect of a, p, qand k on the basic function.

(d) Teachers should explain the different strategies that could be used to solving trigonometric equations.

(e) It is advisable to make use of questions from past examination papers as a useful resource in the class. This will give learners some idea of what is required of them in this aspect of the work.

(f) Teachers are encouraged to test learners ability to sketch and interpret graphs. Learners should be shown that increasing and decreasing functions that they apply in Algebra is still aplicable to trigonometric graphs.

QUESTION 7: TRIGONOMETRY

This question was poorly answered by most candidates with some not even answering the question. This shows that candidates have adopted a negative attitude towards solving 3-D problems, and more so if the sides and angles are in terms of variables instead of values.

Common errors and misconceptions

(a) Candidates had difficulty in seeing the different planes in the sketch.

(b) In Q7.1, candidates failed to identify that ABCD was a square and hence AOB is a right-angled triangle having AB as its hypotenuse. Some candidates were not able to apply the Theorem of Pythagoras correctly in ΔAOB. They did not realise that AO = OB. Some candidates attempted to use the distance formula to calculate the length of OB despite the fact that there were no coordinates given.

(c) Many candidates were confused with the 3-D orientation of the shape. Many did not realise that ΔEOB was right-angled. They could not select the correct sides and angles in ΔAEB. Many did not see that EB was common to both ΔEOB and ΔAEB. Very few realised that they needed to use the cosine rule to answer this question.

(d) Candidates demonstrated poor algebraic manipulation skills. They were unable to make $\cos\theta$ the subject of the formula in Q7.2.

(e) Many candidates did not attempt Q7.3. They could not link Q7.2 and the given volume to solve for θ. Candidates also took the area of the base to be 3 instead of 9.

Suggestions for improvement

(a) Teachers should discuss the minimum requirements for each triangle rule to be used. It is advisable that these be discussed in conjunction with a sketch.

(b) Teachers need to develop strategies to be used when solving right-angled triangles and triangles that are not right-angled.

(c) In Grades 10 and 11, learners should be exposed to problems that involve a combination of shapes in 2-D. This should develop the skill of identifying common sides and angles in composite shapes.

(d) Learners should be encouraged to highlight the different triangles using different colours. This would allow them to identify the common sides and angles.

(e) Teachers should use models to show the different planes in a 3-D shape. This will help learners to identify the different triangles and to place the sides and angles in perspective.

(f) Initially, expose learners to numeric questions on solving 3-D problems. This makes it easier for learners to develop strategies on how to solve such questions. Once learners have gained confidence with numeric type questions, they should be exposed to non-numeric and higher order questions.

QUESTION 8:
EUCLIDEAN GEOMETRY

With the exception of Q8.2.2. most candidates achieved good marks in this question. It was very encouraging to note that some candidates scored full marks in this question.

Common errors and misconceptions

(a) Generally, candidates either lost marks for incorrect or incomplete reasons or for naming angles incorrectly.

(b) In Q8.1.1, candidates failed to state which lines were parallel when providing a reason. A number of candidates assumed that SR was a tangent and gave the tan-chord theorem as the reason.

(c) In Q8.1.2(a), many candidates stated that $\hat{T}_2 = 70°$ without providing a reason or gave the reason as alternate angles. This did not earn them any marks. Other candidates assumed that SR was a tangent and concluded that $\hat{Q}_1 = 70°$ because of the tan-chord theorem.

(d) Candidates made that assumption that $\hat{S} = 70°$ and used this to calculate the size of $\hat{P}_1$. Others made the assumption that PQRS was a cyclic quadrilateral and tried to use the exterior angle of the cyclic quadrilateral theorem to calculate the size of $\hat{P}_1$.

(e) In Q8.2.2, candidates attempted to solve this question by only working in one triangle. This was not possible. Other candidates made incorrect substitutions into the Theorem of Pythagoras or made basic computational errors. The vast majority rewrote the given information as $\frac{OS}{OT} = \frac{7}{15}$ and from this concluded that OS = 7 units and OT = 15 units. Whilst this was indeed the case, it is not correct to make such assumptions from a proportion. Such conclusions must first be proved before candidates may use them in an answer.

Suggestions for improvement

(a) Learners need to be informed that merely writing a number of correct statements and reasons will not necessarily earn them marks. The statements must be logical and lead to solving the problem.

(b) Learners should be encouraged to scrutinise the given information and the diagram for clues about which theorems could be used in answering the question.

(c) Teachers must cover the basic work thoroughly. An explanation of the theorem should be accompanied by showing the relationship in a diagram. Teachers should use the exploratory method for teaching Euclidean Geometry. In this way, learners should be able to remember the facts learnt more effectively.

(d) Teachers need to insist that learners name the angles correctly. The fact that learners are naming angles incorrectly at Grade 12 level indicates that this issue has not been dealt with effectively in earlier grades.

(e) Learners should be taught that all statements must be accompanied by reasons. Teachers and learners must refer to the Examination Guidelines for a list of acceptable reasons to be used in Euclidean Geometry. Teachers should insist that learners use the correct shortened forms of reasons in class. It is important to state which lines are parallel when using corresponding angles, alternate angles and co-interior angles as a reason.

QUESTION 9:
EUCLIDEAN GEOMETRY

Many more candidates attempted this question than in the past. Candidates employed different approaches to this question. This showed that candidates are coming to grips with solving problems in Euclidean Geometry. Performance in this question ranged from poor to very good.

Common errors and misconceptions

(a) Candidates showed little understanding of the difference between a theorem and its converse. They did not understand when to use the theorem and when the converse would apply.

(b) Q9.1.1 was answered correctly by the vast majority of candidates. There were some who provided incorrect reasons. In Q9.1.2, many candidates omitted the parallel lines from the reason.

(c) In Q9.2 many candidates assumed that BCDE was a cyclic quadrilateral. They went on to state that $\hat{E}_2 = \hat{D}_2 = x$ because angles in the same segment were equal. Therefore, BCDE is a cyclic quadrilateral. Such circular arguments are not acceptable. Other candidates assumed that FD || BC in their attempts to prove that BCDE is a cyclic quadrilateral.

(d) Many candidates did not read Q9.3 carefully and stated the two angles that were already given to be equal to x as the answer. The question required two other angles. A number of candidates did not use the fact that BCDE was a cyclic quadrilateral to answer Q9.3. Candidates named the angles incorrectly: $B\hat{C}D$ was named as $\hat{C}_{1+2}$.

(e) Q9.4 was poorly answered. Candidates made many irrelevant statements about equal angles.

Suggestions for improvement

(a) Learners should be forced to use acceptable reasons in Euclidean Geometry. Teachers should explain the difference between a theorem and its converse. They should also explain the conditions for which theorems are applicable and when the converse will apply.

(b) When required to prove that BCDE is a cyclic quadrilateral, it implies that the candidates must show that a circle passes through the points B, C, D and E. Therefore, candidates cannot use any words that refer to a circle when referring to points B, C, D and E.

(c) Teachers should allow learners to present their solutions in the classroom situation. Other learners should be asked to point out errors and to provide alternative solutions to the same question. This kind of discussion should encourage problem-solving skills.

(d) Learners need to be told that success in answering Euclidean Geometry comes from regular practice, starting off with the easy and progressing to the difficult. There is no short-cut to this process.

QUESTION 10: EUCLIDEAN GEOMETRY

This question was poorly answered by the majority of the candidates.

Common errors and misconceptions

(a) Many candidates did not show the construction on their sketches nor did they state it. This constituted a breakdown in the proof. Subsequently, candidates lost marks for this omission. Other candidates did show the construction but then selected the incorrect triangles in the proof. Candidates also omitted a key step in the proof, i.e. that two triangles having the same base and between the same two parallel lines have equal area.

(b) In Q10.2.1, candidates again failed to mention the parallel lines in the reason.

(c) In 10.2.2(a), candidates struggled to establish that the proportionality theorem could be used to answer the question.

(d) The main strategy used to answer Q10.2.2(b) was to write down the pairs of angles that were equal according to the way the triangles were named in the question. Often these statements were not accompanied by any reason. These candidates were not awarded any marks for simply stating that a pair of angles was equal. It took some work to show that $M\hat{F}H$ was equal to $M\hat{G}F$. Some candidates made statements that were not relevant to the answer. Some candidates confused similarity and congruence.

(e) Many candidates did not link Q10.2.2 and Q10.2.3 and therefore found it difficult to answer Q10.2.3. They also used incorrect proportions in their working.

Suggestions for improvement

(a) More time needs to be spent on the teaching of Euclidean Geometry in all grades. Time must be spent on teaching the theory, recognising the theorems in a simple diagram and deconstructing a complex diagram to identify theorems.

(b) Learners need to be told that there is no short-cut to mastering the skills required in answering questions on Euclidean Geometry. This requires continuous and deliberate practice.

(c) Learners need to be made aware that writing correct but irrelevant statements will not earn them any marks in an examination.

(d) Learners must refrain from making assumptions. If they make a statement about the relationship between sides or angles, then they must prove such a statement as true before they can use it.

(b) The teaching of theorems should be done with the relevant understanding. Teachers should refrain from teaching by copying theorems from a textbook.bout visiting the zoo from their own experiences rather than relating to the graph. Candidates failed to establish the trend shown in the given bar graph.

(c) The candidate's command of the language was a challenge in Q4.1.4, Q4.3.3 and Q4.3.4 as they were not able to express themselves in order to give correct responses.

Suggestions for improvement

(a) Learners should be taught how to interpret questions in order to understand what response is required,for example in Q4.2.4,candidates were required to measure the distance on the map in mm and then use 200m = 20mm to verify if 85 mm = 1,6 km.

(b) Teachers should provide learners with more complex graphs where different pieces of information can be compared in order to make sound decisions.

(c) Teachers should teach learners how to estimate, especially when working with plans where no scale is given.

(d) Learners should be given compound bar graphs to interpretunder the guidance of the teacherin order to develop the skill of making sound decisions from complex graphs.

CHAPTER 12: PHYSICAL SCIENCES

The following should be read in conjunction with the Physical Sciences question paper of November 2016 examination.

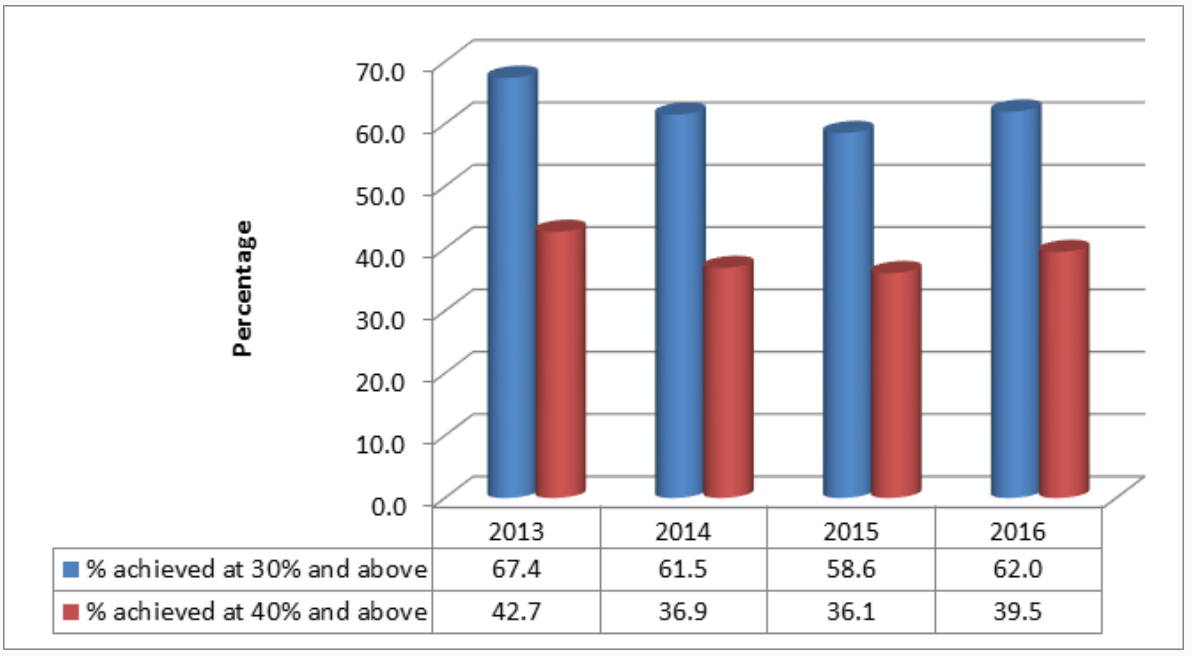
12.1. PERFORMANCE TRENDS (2013 – 2016)

The general performance of candidates improved this year as indicated by 62,0% of candidates achieving at 30% and above, with 39,5% achieving at 40% and above.

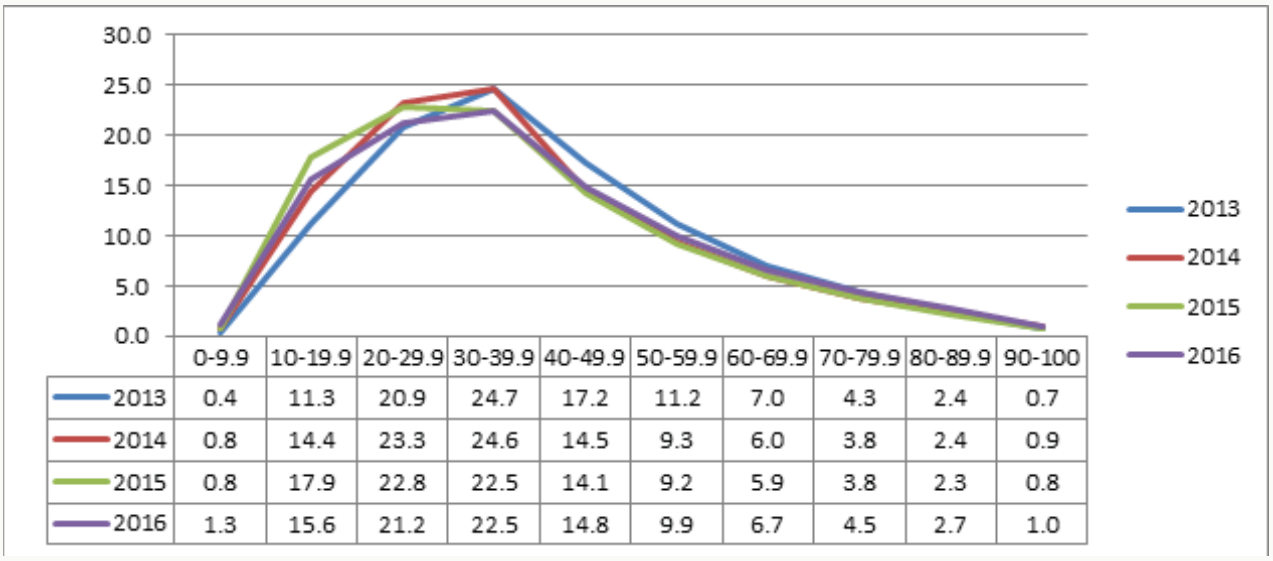
Table 12.1.1 Overall achievement in Physical Sciences

Year	No Wrote	No. achieved at 30% and above	% achieved at 30% and above	No. achieved at 40% and above	% achieved at 40% and above
2013	184 383	124 206	67,4	78 677	42,7
2014	167 997	103 348	61,5	62 032	36,9
2015	193 189	113 121	58,6	69 699	36,1
2016	192 618	119 427	62.0	76 044	39.5

Graph 12.1.1 Overall achievement in Physical Sciences



Graph 12.1.2 Performance distribution curves in Physical Sciences



	0-9.9	10-19.9	20-29.9	30-39.9	40-49.9	50-59.9	60-69.9	70-79.9	80-89.9	90-100
2013	0.4	11.3	20.9	24.7	17.2	11.2	7.0	4.3	2.4	0.7
2014	0.8	14.4	23.3	24.6	14.5	9.3	6.0	3.8	2.4	0.9
2015	0.8	17.9	22.8	22.5	14.1	9.2	5.9	3.8	2.3	0.8
2016	1.3	15.6	21.2	22.5	14.8	9.9	6.7	4.5	2.7	1.0

From the above graphs, it is evident thatthere has been anincrease in the performance of candidates compared to last year.

12.2. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 1

General Comments

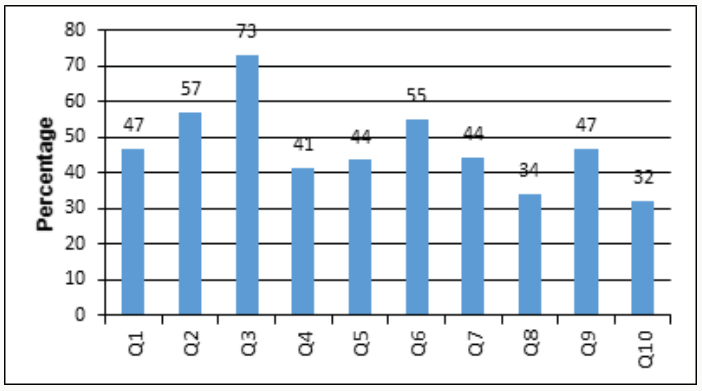
(a) Questions on Newton's Laws of Motion, Vertical Projectile Motion, Doppler Effect and Electrodynamics (Q2, Q3, Q6 and Q9) were generally well answered.

(b) Candidates did not perform well in Q8 (Electric Circuits) and performed very poorly in Q10 (Photo Electric Effect).

12.3. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 1

The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

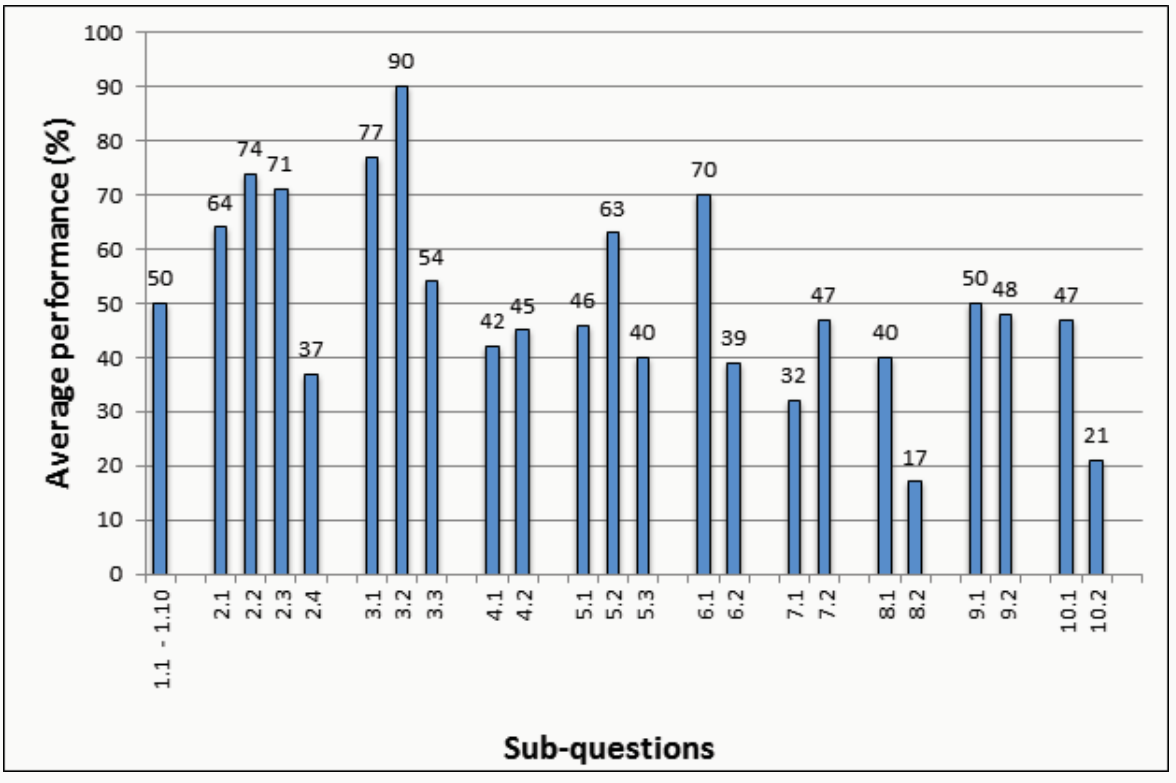
Graph 12.3.1 Average marks per question expressed as a percentage for Paper 1



Q1	Multiple choice questions - all topics
Q2	Newton's laws of motion
Q3	Vertical projectile motion
Q4	Momentum
Q5	Work, energy and power
Q6	Doppler effect
Q7	Electrostatics (Coulomb's Law and Electric fields)
Q8	Electric circuits
Q9	Electrodynamics: Motors, generators and alternating current
Q10	Photo-electric effect

Q8 on electric circuits was the worst answered question followed by the photo-electric effect in Q10. This is probably due to a lack of emphasis on practical work and an inability to solve problems that require learners to integrate knowledge learnt in different sections of Physics e.g. mechanics with electricity.

Graph 12.3.2 Average marks per sub question: Paper 1



12.4. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 1

QUESTION 1: MULTIPLE CHOICE

This question was fairly well answered. However, Q1.2, Q1.5, Q1.8 and Q1.9 were poorly answered.Q1.2 was the worst answered question while Q1.1 and Q1.6 were the best answered questions.

Common errors and misconceptions

(a) Most candidates saw Q1.2as a proportionality question rather than a question that tests their understanding that the mass of an object is always the same irrespective of its position above the earth.

(b) Candidates failed to realise that in Q1.5, the block was released from rest, i.e., the velocity is zero at point Q. As a result of this, its kinetic energy is zero, and its mechanical energy is conserved.

(c) Q1.8: The graph was presented differently, with the gradient representing $\frac{1}{R}$ (conductance) instead of R (resistance). Candidates had a challenge with logical reasoning ability. They failed to see that the straight-line graph with the largest slope represented the smallest resistor, i.e. the greater $\frac{1}{R}$ is,the smaller R is.

(d) Q1.9: Candidates failed to apply the relationship between *area of the coil* and *induced emf* in a generator.

Suggestions for improvement

(a) Teachers must use multiple choice questions in every assessment activity.

(b) During the revision of multiple choice questions, learners must be given an opportunity to explain the choices they made so that misconceptions can be identified and corrected.

(c) Greater emphasis should be placed on interpretation of graphs including an interpretation of the shapes of graphs as well as the gradients of graphs

(d) The relationship between variables in formulas should be emphasized.

QUESTION 2: NEWTONS LAWS OF MOTION

The question was fairly well answered, with some sub-questions (e.g. Q2.4.1) answered very poorly. The skill of solving equations simultaneously is still lacking.

Common errors and misconceptions

(a) Q2.1 required definitions. The definitions should be taken from the Curriculum and Assessment Policy Statement (CAPS) and the Examination Guideline. The omission of important key words, such as 'net force' and 'directly proportional' were still quite common. Candidates are still using the term 'indirectly proportional' instead of inversely proportional.

(b) In Q2.2, candidatesommittedthe subscripts in the formula and units in the final answer (confusing 'kinetic frictional force' with 'coefficient of kinetic friction'), used the wrong formula 'F_{net} = ma' instead of '$f_k = \mu_k N$', and wrote F_N as 'mg·cos30º'instead of just 'mg'.

(c) In Q2.3, candidates drew free body diagrams in which the lines representing the forces have no arrows and do not make contact with the object.

(d) In Q2.4.1, candidates failed to calculate the vertical component of the applied force and incorrectly calculated the normal as being equal in magnitude to the gravitational force. Many candidates did not know that the normal is not always equal in magnitude to the gravitational force.

Suggestions for improvement

(a) The simultaneous equation/two system method using free body diagrams must be taught at schools.

(b) Learners should be exposed to a variety of contexts in which they do problem-solving involving Newton's second law.

(c) Emphasize the sketching of labelled free body diagrams.

QUESTION 3:
VERTICAL PROJECTILE MOTION

This was the best performed question.

Common errors and misconceptions

(a) InQ3.1, candidates omitted the key word 'only' in their definitions and confused'gravitational force' with 'gravitational acceleration'.

(b) In Q3.2.2, candidates interchanged the initial and final velocities, didnot follow sign convention, didnot round off the final answer to a minimum of two decimal places and wrote the unit of time as 'sec' instead of 's'.

(c) The skill of graph sketching required in Q3.3 is still severely lacking.

(d) Some candidates could not substitute correctly.

Suggestions for improvement

(a) Use the CAPS and the Examination Guideline documents for definitions.

(b) Learners should be taught to indicate their chosen sign convention at the beginning of the problem and to use their chosen sign convention in solving the problem.

(c) Emphasise the basics of graphing skills.

QUESTION 4:
MOMENTUM

This question was fairly well answered.

Common errors and misconceptions

(a) In Q4.1, candidates failed to define an isolated system. Most of them defined it as a system in which momentum is conserved.

(b) In Q4.2.1,candidates used incorrect equations, namely $\Delta p = mv$ and $F_{net} = \Delta p$

(c) In Q4.2.2,candidates were unable to read and interpret the graph. They could not read the initial momentum and final momentum of car A correctly from the graph.

(d) In Q4.2.3,candidates did not realise that the slope of the graph is equal to the net average force. Co-ordinates were incorrectly read from the graph.

Suggestions for improvement

(a) Learners should be exposed to different contexts of momentum type problems.

(b) Learners must be taught to differentiate between 'momentum' and the 'change in momentum'. The vector nature of velocity must always be considered when dealing with momentum related questions.

(c) Teachers must represent information using graphs and allow learners to read, analyze and interpret the graphs.

(d) Teachers should expose learners to problem-solving exercises that require them to draw graphs from given or inferred information.

(e) Learners should be encouraged to explore different ways of solving the same problem.

QUESTION 5:
WORK, ENERGY AND POWER

This question was generally well answered with the exception of Q5.1.2.

Common errors and misconceptions

(a) In Q5.1.1, candidates usedthe principle of conservation of mechanical energy instead of simply calculating the kinetic energy from the given information and the formula for kinetic energy on the data sheet.

(b) In Q5.1.2,candidates used the principle of conservation of linear momentum instead of the conservation of mechanical energy.

(c) A number of candidates could not state the work-energy theorem.

(d) In Q5.3 candidates could not identify frictional force as the only non-conservative force that can do work on the object.

(e) Candidates could not apply the 'conservation of mechanical energy' to a system of objects.

Suggestions for improvement

(a) Learners must draw free body diagrams for questions requiring calculations using work-energy principles.

(b) Teachers should provide learners with different types of questions on conservative and non-conservative forces, work-energy theorem, and conservation of mechanical energy.

(c) Show learners that $W_{net} = \Delta Ek$ and $W_{nc} = \Delta K + \Delta U$ can both be used to solve the same problem.

(d) Learners should be given problem-solving exercises that require them to apply the 'conservation of mechanical energy' to systems that have more than one object.

QUESTION 6: DOPPLER EFFECT

Candidates performed well in this question.

Common errors and misconceptions

(a) In Q6.1.1,most candidates failed to state the Doppler effect correctly.

(b) In Q6.1.2, common errors were:

- The use of the formula $c = f\lambda$ instead of $v = f\lambda$.
- They used speed of the ambulance (30 $m \cdot s^{-1}$) instead of speed of sound in air (340 $m \cdot s^{-1}$) to calculate the frequency of the source.
- Use of the Doppler equation to calculate the frequency of the source.
- Writing hz as a unit for frequency instead of Hz.

(c) In Q6.1.3,common errors were:

- They calculated f_s in Q6.1.2 substituted as f_L
- $f_s$was substituted as 30 and not the value calculated in Q6.1.2

(d) In Q6.2,candidates could not explain the phenomenon in terms of frequency. They could not relate frequency of light to colour.

Suggestions for improvement

(a) Teach learners definitions as prescribed in the CAPS and the Examination Guidelines for Physical Sciences.

(b) Learners mustknow that there is only one formula for the Doppler Effect as well as the meaning of each symbol in the Doppler equation.Learners also need to understand why velocities are added or subtracted in the Doppler Effect formula. Diagrams depicting wavefronts would assist in teaching this.

(c) Learners should be exposed to more problems requiring the analysis of data from a table or graph.

QUESTION 7:
ELECTROSTATICS (COULOMB'S LAW AND ELECTRIC FIELDS)

Q7.1.4 was poorly answered.

Common errors and misconceptions

(a) In Q7.1.1, candidates confused Coulomb's law with the law of Universal Gravitation as they made mention of the mass.

(b) Performance in Q7.1.2, Q7.1.3 &Q7.1.4 was below expectation as candidatesdisplayed their inability to analyze and interpret the graph correctly. They could not identify the dependent variable from the graph.

(c) Q7.1.4 was the worst performed question as candidates failed to use the slope of the graph to calculate the charge on each sphere. Candidates used the incorrect formula F = to answer the question. Candidates confused the concepts of 'electric field' with 'electric force' and hence made up an incorrect formula.

(d) In Q7.2.1, candidates could not draw a simple electric field pattern.

(e) In Q7.2.2,most candidates calculated force, F, instead of electric field, E. Candidates also failed to convert centimeters to meters and some expressed micro-coulombs as 10^{-9} instead of 10^{-6}. They also ignored the vector nature of the electric field in their calculation.

Suggestions for improvement

(a) Learners should know that the dependent variables are in the y-axis and familiarize themselves with the terms 'direct' and 'inversely proportional'.More time should be spent on interpreting the graphs as well as how to use the graph to calculate the gradient.

(b) Learners should practice the drawing of electric fields as well as the conversion of units and should also know the difference between an 'electrical field' and an 'electrostatic force'.

(c) Revision of electrostatics done in Grades 10 and 11 should be ongoing throughout the Grade 12 year,exposing learners to solve problems where they must interpret graphs.

(d) Learners should be given enough electrostatics exercises from previous exam papers and other supplementary sources as homework in the Grade 12 year where they need to apply the principle of superposition of fields.

(e) Teachers must teach the appriopriate strategy for converting units on a daily basis in all sections of the curriculum.

QUESTION 8:
ELECTRIC CIRCUITS

This question was answered poorly.

Common errors and misconceptions

(a) In Q8.1.1,candidates could not clearly distinguish between the concepts 'emf', 'potential difference' and 'lost volts'. They could not define the emf of a battery.

(b) In Q8.1.2 &Q8.1.3 some candidates misunderstood the question and wrote 'increase' or 'decrease' instead of the reading on the voltmeter.

(c) In Q8.2.1,candidates omitted subscripts in the formula $P_{ave} = Fv_{ave.}$

(d) Q8.2 was an integration of two topics viz. power in the gravitational field to the power in the electric field. Candidates could not integrate concepts learnt in mechanics to concepts in electricity.

(e) Candidates displayed incorrect use and manipulation of the parallel resistors formula. They used $R = \frac{1}{R_1} + \frac{1}{R_2}$ instead of $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$.

Suggestions for improvement

(a) It is critical that learners are given problem solving exercises that integrate the different knowledge areas in the curriculum, e.g. mechanics with electricity, mechanics with electrostatics, etc.

(b) The basics of resistors connected in series and parallel should always be revised.The concept of power of components in electric circuits should be emphasised.

(c) Emf = I(R + r), V = IR and $V_{"lost"} = Ir$ are all equations used to determine potential difference. Explain their differences thoroughly.

(d) It is absolutely critical that learners conduct the prescribed experiments in CAPS.

QUESTION 9:
ELECTRODYNAMICS

This question was generally well answered.

Common errors and misconceptions

(a) Although most candidates managed to identify the generator in Q9.1.1, they could not give a correct reason for identifying it as a DC generator.

(b) In Q9.1.2,most candidates could not draw the graph of induced emf vs time correctly.

(c) In Q9.2.1 &Q9.2.2,candidates did not use the formulae given on the formulae sheet. Omitting of subscripts and rounding off final answers to two decimal places were common.

Suggestions for improvement

(a) The features of a DC generator that make it different from an AC generator must be emphasised.

(b) Learners must be trained to draw graphs and be able identify a complete cycle from either an AC or a DC graph.

(c) The importance of using subscripts in AC circuits should be emphasised.

QUESTION 10: PHOTO-ELECTRIC EFFECT

This question was not well answered.

Common errors and misconceptions

(a) In Q10.1.1, many candidates could not define 'threshold frequency'.

(b) In Q10.1.2 to Q10.1.4, candidates were unable to analyze and interpret the graphs correctly.

(c) In Q10.2.1,candidates lacked of knowledge of the term 'efficiency'. Candidates calculated only the energy of the photon.

(d) In Q10.2.2, candidates could not relate the number of photons calculated in Q10.2.1 to number of electrons released in Q10.2.2

Suggestions for improvement

(a) Learners must be taught accurate interpretation of formulae, e.g. $W_{0=}hf_0$from which it can be deduced that $W_o \alpha f_o$.

More practice is needed in analysing variables in different forms e.g. $E_k vs \frac{1}{\lambda}$.

(b) Emphasise the relationship between 'energy' and 'number of photons'.

(c) Learners need more exposure in this section to questions based on data in tables and graphs.

12.5. OVERVIEW OF LEARNER PERFORMANCE IN PAPER 2

General Comments

(a) Candidates performed poorly in the following questions: Q5, Q6, Q7 and Q10.

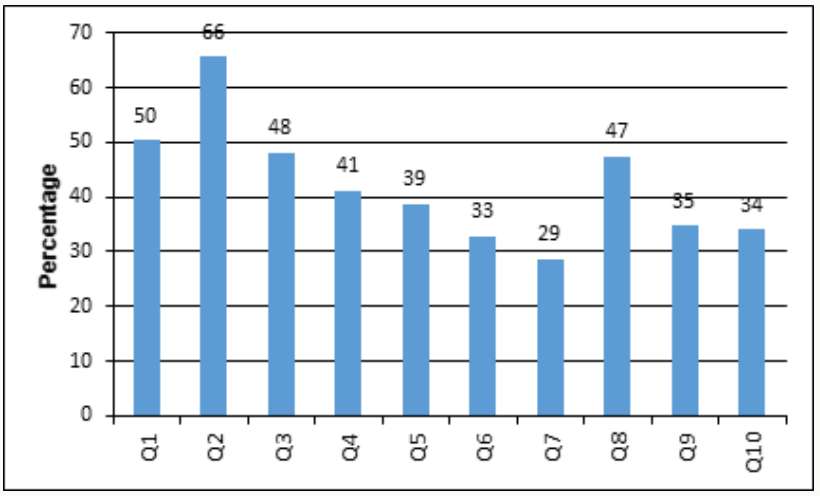
(b) The questions on organic chemistry (Q2, Q3) were generally well answered.

(c) Candidates lacked the skills required to use the Table of Standard Reduction Potentialsrequired for Q8 and Q9 to identify the correct oxidising and reducing agents.

12.6. DIAGNOSTIC QUESTION ANALYSIS FOR PAPER 2

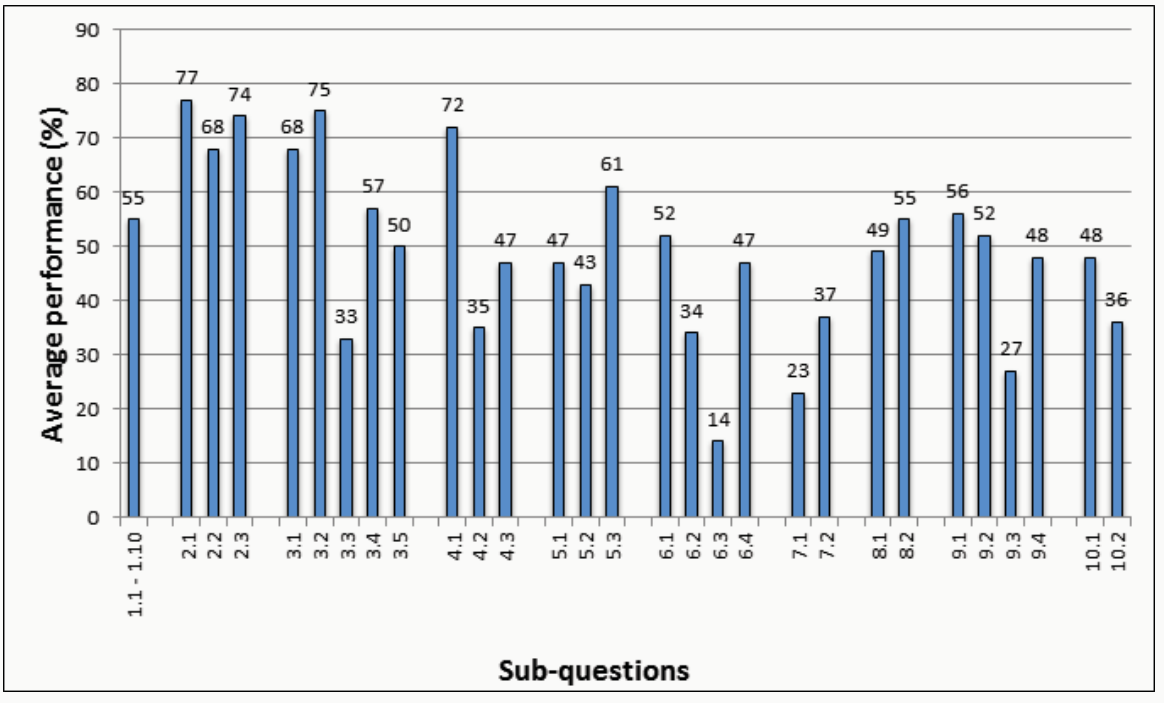
The following graph is based on data from a random sample of candidates. While this graph might not accurately reflect national averages, it is useful in assessing the relative degrees of challenge of each question as experienced by candidates.

Graph 12.6.1 Average marks per question expressed as a percentage: Paper 2



Q1	Multiple choice questions; all topics
Q2	Organic nomenclature
Q3	Physical properties of organic compounds
Q4	Organic reactions
Q5	Reaction rate & stoichiometry
Q6	Chemical equilibrium
Q7	Acids and bases & stoichiometry
Q8	Galvanic cells
Q9	Electrolytic cells
Q10	Fertilisers

Graph 12.6.2 Average marks per sub question: Paper 2



12.7. ANALYSIS OF LEARNER PERFORMANCE IN EACH QUESTION IN PAPER 2

QUESTION 1: MULTIPLE CHOICE QUESTIONS

Q1.3, Q1.4 and Q1.5 were well answered. Q1.7 to Q1.10 were poorly answered. Questions 1.9 and 1.10 were the most challenging to candidates.

Common errors and misconceptions

(a) Q1.1 was not well answered. Many candidates thought that an oxidising agent is oxidised and thus loses electrons.

(b) In Q1.2, candidates may not have been aware of the word'FALSE'in the question.

(c) In Q1.6,many candidates did not know that both reactions I and II are part of the Ostwald process.

(d) In Q1.7, candidates struggled to choose the pair that is NOT a conjugate acid-base pair correctly. $H_2PO_4^-$ and HPO_4^{2-} was the most common incorrect answer. Conjugate acid-base pairs differ by only one H^+.

(e) In Q1.8, candidates failed to understand that pressure will have no effect on the given equilibrium because the number of moles of reactants is the same as the number of moles of product. As pressure increases, the number of moles of reactants and products will remain constant as there is no preferred side to the equation.

(f) In Q1.9, most candidates failed to identify the cathode half-reaction applicable to the electroplating an object and that option *B*is the only half-reaction resulting in the formation of a metal with an oxidation state of zero.

(j) In Q1.10,candidates did not recognise H_2SO_4 as a diprotic acid and thus having twice the H^+ ion concentration than HCℓ, which will result in a higher reaction rate (concentration of reacting species). Due to the mole ratios in the balanced equations, the HCℓ will react with half the amount of Mg (2:1) than H_2SO_4 (1:1) and will also form half of the amount of H_2 than with H_2SO_4. Therefore a greater mass of Mg will remain in test tube **X** after the reaction.

Suggestions for improvement

(a) When explaining the meaning of 'oxidising agent', learners should be made aware that an *oxidising agent* oxidises another substance and it is therefore reduced (gains electrons). Similarly a *reducing agent* reduces another substance and it is therefore oxidised (loses electrons).

(b) When teaching conjugate acid-base pairs, learners should be made aware that the conjugate acid can be obtained from its conjugate base by adding a H^+ to the base. The conjugate base can be obtained from its conjugate acid by removing a H^+.

(c) Learners must be taught that electroplating involves the formation of a metal (a solid) on the cathode of the electrolytic cell and therefore the only half-reaction at the cathode of such a cell is a reduction in which a metal is formed as a product.

QUESTION 2:
NOMENCLATURE OF ORGANIC COMPOUNDS

This question was generally well answered.

Common errors and misconceptions

(a) The weaker performance in Q2.2.2 and Q2.2.3 shows that while candidates have a good knowledge of the basics, concepts like *esterification* and *polymers* need more attention.

Suggestions for improvement

(a) The different types of structural isomers should be emphasised. Learners must be made aware that *positional*, *chain* and *functional isomers* are all different types of structural isomers.

(b) Hyphens and numbers should not be used in the stem of the IUPAC names of alkanes. In alkanes, numbers are only used to indicate the position of alkyl groups on the parent chain.

(c) Learners should be made aware that the structural formula of the monomer of a polymer should not be placed in brackets with 'n' as coefficient, subscript or superscript.Each of these positions for 'n' has a different meaning.The question was only about the monomer.

QUESTION 3:
PHYSICAL PROPERTIES OF ORGANIC COMPOUNDS

The question was, with the exception of Q3.3 and Q3.5, relatively well answered.

Common errors and misconceptions

(a) Q3.3 required an explanation. Many candidates struggled to give a complete logical explanation, as is also evident from Q4.2, Q5.1.4, and Q6.2.2. In this specific question, candidates had to link the shape of the molecule to the strength of the intermolecular forces, and then the energy needed to overcome the intermolecular forces at the boiling point.

(b) Q3.5 was very poorly answered mostly because candidates did not know the meaning of 'combustion'.

Suggestions for improvement

(a) Learners should be taught definitions.

(b) When an explanation of trends in boiling points, vapour pressures and melting points is required, learners should be taught to refer to all three factors,*structure*, strength of *intermolecular forces*as well as the *energy* needed to overcome intermolecular forces, in their explanations.

(c) Learners should be taught that the products in any complete combustion reaction are CO_2 and H_2O.

QUESTION 4:
REACTIONS OF ORGANIC COMPOUNDS

The question was relatively well answered, with the exception of Q4.2 & Q4.3.3.

Common errors and misconceptions

(a) Many candidates did not know that thermal cracking is associated with high temperature(Q4.1.1).

(b) Many identified the homologous series of compound **X** (Q4.1.3) as an *alkanes*instead of an alkene.

(c) The identification of the gas that will decolourise bromine water (Q4.2) was poorly answered. Most candidates chose *butane* as the answerinstead of hexene.

(d) Q4.3.3 was poorly answered. Most candidates found this question challenging. Many of those who drew the structural formula of an alkene, placed the double bond between C_1 and C_2 instead of between C_2 and C_3.

Suggestions for improvement

(a) When teaching cracking of alkanes, learners should be taught that one of the two products must always be an alkene. They should also be made aware every reaction has a unique set of conditions under which it takes place.

(b) Decolourisation of bromine by an alkene (addition, without light) or an alkane (substitution, only in sunlight or when heated) is an easy experiment to demonstrate and will assist learners to understand the difference between these two reaction types better.

(c) More time should be spent teaching learners how to analyse flow diagrams.

QUESTION 5:
REACTION RATE

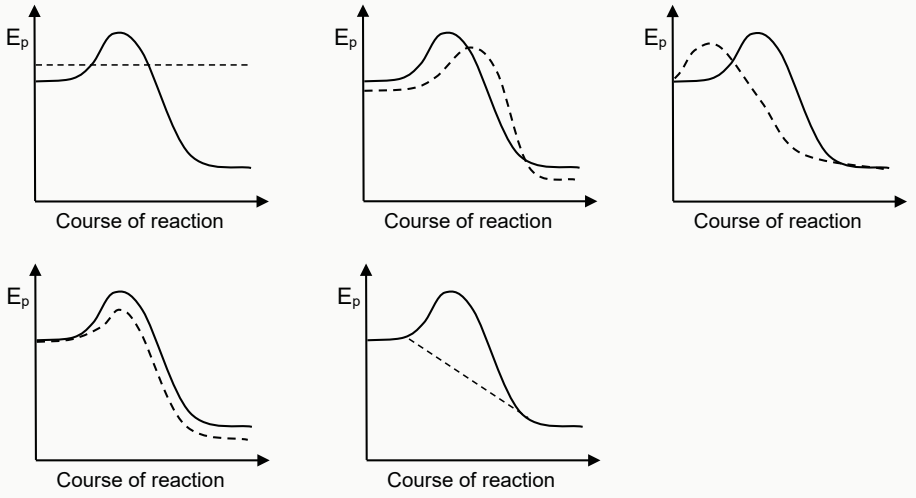
This question was poorly answered with Q5.1.3 & Q5.1.4 having the worst performance.

Common errors and misconceptions

(a) Many candidates omitted the word *minimum* when stating the definition of *activation energy* in Q5.1.1.

(b) The drawing of the potential energy diagram was poorly done as candidates failed to interpret the given data in Q5.1.2.

(c) Many candidates could not display the effect of a catalyst on the potential energy diagram (Q5.1.3). Common errors were:



(d) Many candidates failed to interpret that manganese dioxide was used as a catalyst in the reaction and consequently answered Q5.1.4 in terms of the collision theory very poorly. Common errors were:

- No reference to the effect of a catalyst on the activation energy i.e. a catalyst provides an alternative pathway of lower activation energy.
- Stating that more molecules have higher kinetic energy instead of more molecules have *sufficient kinetic energy*. (A catalyst CANNOT change the kinetic energy of molecules).
- Stating that more effective collisions take place instead of more effective collisions *per unit time*.
- Stating that effective collisions take place per unit time instead of *more* effective collisions per unit time.

(e) Candidates failed to relate the gradient = $\frac{\Delta y}{\Delta x}$ to the rate of the reaction in Q5.2.1. Common errors were:

- Using incorrect volume values from the graph.
- Calculating $\frac{52}{40}$ and $\frac{16}{10}$ separately instead of $\frac{52-16}{40-10}$.
- Addition of volumes and time e.g. $\frac{52+16}{40+10}$.
- Swapping either the two volume values or the two time values e.g. $\frac{52-16}{10-40}$ or $\frac{16-52}{40-10}$.

(f) In Q5.2.2, the common errors were:

- The use of 22,4 $dm^3.mol^{-1}$ instead of the given value of 24 $dm^3.mol^{-1}$
- Using an incorrect volume reading from the graph

- Using the molar mass of O_2 to calculate the mass of H_2O_2
- Using an incorrect mole ratio of O_2 : H_2O_2

Suggestions for improvement

(a) Interpretation of data and identification of variables need to be addressed in class. Learners must be exposed to more exercises which require practical skills, starting from Grade 10.Learners need to be able to express knowledge graphically and also read and use information off graphs.

(b) To assist learners to answer questions which require explanations, more such exercises must be given to learners.

(c) Stoichiometry should be integrated with all topics taught in Grade 12.

QUESTION 6:
CHEMICAL EQUILIBRIUM

This question was poorly answered especially Q6.3

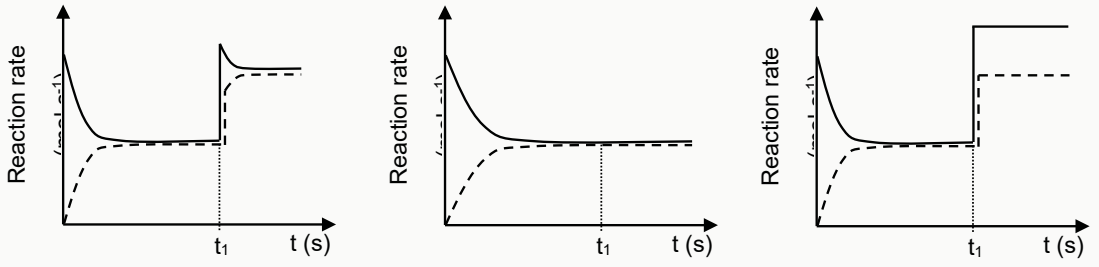
Common errors and misconceptions

(a) Candidates could not defineLe Chatelier's principle correctly in Q6.1.

(b) In Q6.2.1 , many candidates did not know that the addition of a solid will not affect the equilibrium position.

(c) Using Le Chatelier's Principle to explain the shift in the equilibrium position was difficult for candidates in Q6.2.2.

(d) In Q 6.3, many candidates failed to correctly draw the graph showing the effect of a catalyst on the reaction rates. Common errors were:



(e) Common errors in the calculation of K_c (Q6.4) were:

- No K_c expression - Note that $\frac{[\text{products}]}{[\text{reactants}]}$ is NOT a K_c expression)
- Incorrect K_c expression – including S(s) in the expression

Suggestions for improvement

(a) Teachers should place more emphasis on explanations requiring Le Chatelier's principle. Learners should be exposed to more exercises where a theory/law/concept is used in order to practise such explanations.

(b) When explaining in terms of Le Chatelier's principle, learners should be taught to use the following steps:

- Identify the disturbance.
- State that the system will act to oppose this disturbance.
- State which reaction (forward or reverse) will be favoured when opposing the disturbance e.g. the reverse endothermic reaction will be favoured.
- State the effect on, for example, what happens to the number of moles of products/reactants e.g. the number of moles of H_2S will decrease.

(c) More graphical presentations explaining dynamic chemical equilibrium need to be incorporated in class and daily assessment on this section.

QUESTION 7: ACIDS AND BASES

This question was poorly answered

Common errors and misconceptions

(a) The large majority of candidates failed to define the term hydrolysis in Q7.1.1.

(b) Many candidates did not know that $NH_4C\ell$ reacts with water to form an acidic solution in Q7.1.2.

(c) Many candidates calculated the molar mass of H_2SO_4 incorrectly in Q7.2.1.

(d) Common errors in Q7.2.2 were:

- Using an incorrect formula, e.g. $n = \frac{c}{V}$ or $n = \frac{m}{M}$ or $n = \frac{V}{V_m}$
- Using the pH formula as pH = -log[H_2SO_4]
- Failing to use the correct ratio of n(NaOH) : n(H_2SO_4)

Suggestions for improvement

(a) Learners should be taught to label formulae when doing multistep calculations e.g. when calculating the number of moles of H_2SO_4, the formula should be as follows: n(H_2SO_4) = cV

(b) Teach learners that the titration formula ($\frac{c_a v_a}{c_b v_b} = \frac{n_a}{n_b}$) should only be used for neutralisation reactions. Calculations in which there is an excess of acid or base should be solved using stoichiometry as the above equation will not assist them.

(c) Do not do stoichiometry by using mass ratios. (e.g. 4 g of H_2 react with 32 g of O_2.). Proper use of the mole ratiosis much better, as the mass-mass calculations lead to misconceptions.

(d) The equation $n = \frac{V}{V_m}$ can only be used for gases.

(e) Stoichiometry involving word questions should be extended to all sections of chemistry since all molecules undergoes chemical change.

QUESTION 8:
GALVANIC CELLS

There has been an improvement in the candidates' performance as compared to that in 2015.

Common errors and misconceptions

(a) In Q8.1.1,candidates could not differentiate between an electrolyte and an electrode.

(b) Many candidates used a double arrow when writing the half-reaction in Q8.1.2 & Q8.1.3.They also confusedthe cell notation with the cell reaction.

(c) Instead of writing down the cell notation in Q8.2.2, many candidates calculated the cell potentials or wrote the cell reaction.

(d) Q8.2.4 was poorly answered as few candidates knew that increasing the concentration of the oxidising agent increases the emf of the cell.

Suggestions for improvement

(a) The Table of Standard Reduction Potentials is still not well understood by most learners. Time should be spent in class to thoroughly explain how to use the table to identify the oxidising agent and reducing agent and the oxidation and reduction half-reactions.

(b) When writing cell notation, the following convention should be used:

- The $H_2|H^+$ half-cell is treated just like any other half-cell.
- Cell terminals (electrodes) are written on the outside of the cell notation.
- For active electrodes the following sequence should be followed: reducing agent | oxidised species || oxidising agent | reduced species Example: Ni | Ni^{2+} || Ag^+ | Ag
- For inert electrodes (usually Pt or C) the following sequence should be followed: Pt | reducing agent | oxidised species || oxidising agent | reduced species | Pt Example: Pt | $C\ell^-(aq)$ |$C\ell_2(g)$ || $F_2(g)$ | $F^-(aq)$ | Pt

QUESTION 9:
ELECTROLYTIC CELLS

The question was poorly answered although the electrolysis of a concentrated sodium chloride solution is prescribed.

Common errors and misconceptions

(a) Q9.1 was poorly answered. Most candidates did not know that electrolysis is an endothermic process.

(b) In Q9.2,many candidates did not know that carbon is an inert electrode and that it is not oxidised but rather that oxidation takes place at this electrode where the $C\ell^-$-ions are oxidised.

(c) In Q9.3.1 & Q9.3.2, candidates experienced difficulty in the identifying the gases formed at each electrode.

(d) Q9.3.3 was also very poorly answered as candidates did not seem to understand that the Na^+-ion is a weaker oxidising agent than H_2O and therefore cannot undergo reduction in the presence of water.

(e) In Q9.4, although the overall cell reaction was given, candidates failed to associate the alkalinity of the solution with the hydroxide ions.

Suggestions for improvement

(a) Each learner should be supplied with a summary of the five types of prescribed electrolytic cells in which the differences and similarities are clearly differentiated.

(b) Demonstrate some of these reactions. Learners need to see some of the changes occurring in these reactions.

(c) The correct use of the electrode potential table (Table 4A and Table 4B) must be encouraged.

QUESTION 10: FERTILISERS

This question was poorly answered.

Common errors and misconceptions

(a) Most candidates did not know the names of the processes required in Q10.1.1 & Q10.1.2.

(b) Most candidates could not write balanced equations required in Q10.1.4 & Q10.1.5.

(c) The calculation in Q10.2 was poorly answered. Many did not attempt the calculation.

Candidates subtracted the masses of nitrogen and phosphorous from 20 kg as if the mass of fertiliser in the bag was 20 kg.

Other common errors were:

- Ratios were not written as whole numbers
- Incorrect spelling of the names of the processes

Suggestions for improvement

(a) More attention should be paid to fertilisers as a topic. Every effort should be made to finish this section of the work so that there is enough time for revision and testing of this topic. Candidates need feedback on their tests in order to eradicate the common errors

CHAPTER 13: CONCLUSION

The 2016 Diagnostic Report provides valuable information to bring about a higher quality of responses presented by candidates in the NSC Examination. Making the best use of available data and findings in this report by education managers and practitioners is crucial for improving the quality of basic education and for the department to support constructive remediation in identified areas.

The Diagnostic Report needs to become the centre piece of teaching and learning in all Grade 12 classrooms.

The DBE has developed an Improvement Framework which must be used in conjunction with the subject reports, and is attached to the 2016 Diagnostic Report.

Provincial Education Departments are encouraged to monitor districts and schools to ensure that the reports reach the schools, and that they are effectively utilised.

The DBE will, on the other hand, monitor trends in improvement more closely in the coming year and is expectant of improved learner responses in 2017.

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