

## QUALITATIVE ANALYSIS OF LEARNER RESPONSES AND EVALUATION OF QUESTION PAPERS

**INSTRUCTIONS FOR COMPLETION**

1. The reports on Qualitative Analysis of Learner responses and Evaluation of question papers are intended to:
	1. Provide an in-depth analysis of the nature of learner responses, which will facilitate feedback to teaching and learning.
	2. Provide an evaluation of the question paper and marking guideline, which would serve as inputs into the standardization process, conducted by Umalusi.
2. This report must be completed by the internal moderator in conjunction with the chief marker and senior markers, incorporating inputs from markers as well. The internal moderator is however, finally responsible for this report.
3. The report must be completed in detail and single word responses will not be accepted.
4. Where additional space may be required, use a separate page which must be appended to this report.
5. The final report must be approved by the Head of Examinations in the province.
6. The report must be submitted to the Department of Education (for attention: Mrs BT Mangcipu: email: Mangcipu.b@dbe.gov.za ; fax: 086 541 0127 fax hours after marking is completed.

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| **SUBJECT**  |  |  **MATHEMATICAL LITERACY** |
| **PAPER**  | **1 & 2** |
| **DURATION OF PAPER**  |  **3 HOURS** |
| **PROVINCE**  |  **NORTH WEST** |
| **NAME OF THE INTERNAL MODERATOR**  |  | **Ms E. PHASHA & Mr P.H.K MOKGATLE** |
| **NAME OF THE CHIEF MARKER** |  | **Ms A. VAN ROOYEN & Ms J. BARLOW** |
| **NAME OF THE SUBJECT ANALYST** |  | **Ms L.L SEBATA & Ms N.C MOTSHOANE** |
| **DATES OF MARKING**  |  | **30.11.13 – 11.12.13** |
| **HEAD OF EXAMINATION:**  |  | **MR B.J NOTHNAGEL** |
|  **REPORT 1: QUALITATIVE ANALYSIS OF LEARNERS’ RESPONSE** |

This section of the instrument is aimed at providing valuable feedback to schools, subject advisors, teachers and learners about common errors committed by candidates in the answering of questions, to assist teachers and subject advisors to identify areas that need to be given special attention in the teaching and learning of the subject in 2013.

In order to assist the internal moderator with the analysis of learner responses, the internal moderator must analyze, per question, a random sample of 100 scripts. This entails recording the responses (i.e. marks obtained) by learners from these 100 scripts on a per question basis. From the analysis, a detailed explanation must be provided **per question** on this template. You may include sub questions where necessary. **Please use a separate sheet for each question**

Your responses will be based on two parts:

**Section 1:** General overview of Learner performance in the question paper as a whole

**Section 2:** Comment on candidates’ performance on individual questions (Detailed explanations must be provided **per question** as follows: (You may include sub questions where necessary)

1. General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
2. Why the question was poorly answered?

(c) Provide suggestion for improvement in relation to teaching and learning

(d) Describe any other specific observations relating to responses of learners

(e) Any other comments useful to teachers, subject advisors, teacher development

**REPORT FORMAT**

**SECTION 1**

**(General overview of Learner Performance in the question paper as a whole)**

**PAPER 1**

* According to performance analysis and sampled scripts, candidates performed

 almost the same as previous year.

* The question paper was of the required standard and the average candidate would perform well.
* The contexts in this question paper show a variety of questions and this offered opportunity to candidates to apply their knowledge and skills.
* However there were some candidates who did not attempt question 6 because they spend most of their time in some questions

**PAPER 2**

* The paper required a lot of reading with understanding.
* Candidates doing this subject in their second language found this paper difficult to understand.
* A figure that was not asked in the previous question paper, a pentagon, was found difficult by more than 80% of the candidates.
* The majority of the candidates were able to draw graphs correctly.
* Candidates had to formulate more than one formula which is a difficult concept for them.

**SECTION 2**

**(Comments on candidates’ performance in the five individual sub questions (a) – (e) will be provided below. Comments will be provided for each question on a separate sheet.)**

**QUESTION 1**

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| **(a) General comments on the performance of learners in the specific question. Was the question well answered or poorly answered?** |

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| **(b) Reasons why the paper was poorly answered. Specific examples, common errors  and misconceptions are indicated.****(c) Suggestions for improvement in relation to teaching and learning.** |

**PAPER 1**

**COMMON ERRORS:**

* Some candidates used wrong mathematical operations.
* The use of a calculator was a challenge to some candidates.
* Doing time calculation.
* Working with larger numbers e.g. 1,02 million.
* Calculating the number of sheep if the total number of sheep and cattle and their ratio was given.
* Interpreting information given in a table.
* Substitution into given formula.
* Calculating price before VAT if price VAT included is given.
* Including units when giving an answer
* Arranging numbers in ascending order.
* Rounding down or up depending on context.
* Working with direct or indirect proportions.
* Knowing that probability must be written as a common fraction, decimal or percentage, but not as a ratio.
* Understanding that one set of data can have more than one mode.
* Knowing the difference between mode and mean.
* Knowing the difference between cost price, selling price and profit.
* The use of the scale bar on the map and map interpretation.
* Drawing of the inverse and straight line graphs using annexure.
* Language barrier.
* Reading information from the pie chart.

**SUGGESTIONS:**

* BODMAS rule should be emphasised.
* Candidates must have their own calculator in order to familiarise themselves with how it operates.
* Basic knowledge on shifting comma should be done as part of revision.
* Teachers must show learners how to calculate time using a calculator.
* Candidates should take note on when to round up or down depending on the context.
* Calculations involve dividing or sharing of number of any item including the ratio should be emphasised.
* The difference between the median and mean should be clearly outlined.
* Candidates should be exposed to different type’s graphs/ functions including variables.

e. g dependent and independent variable.

* Different context must be introduced in class for learners to interpret.
* Candidates are advised to read instructions carefully because the guidance was provided in the question.
* Teachers need to find resources in the media and develop questions from the resources that will assist candidates in working with percentages.
* Teachers need to give candidates the opportunity to work and analyse given information in order to answer the questions.
* More questions on map work must be given to learners to interpret.
* Teacher development should focus on basic knowledge e.g. Conversions, rounding up or down and Probability.
* Teachers should also assist learners on Finance especially VAT inclusive and VAT inclusive.
* Candidates should learn how to use the scale bar to calculate the actual length.
* Teachers must expose candidates to compound tables and not be textbook bound.
* More work on interpretation of tables must be given to learners.
* Candidates must be encouraged to be careful when analysing tables, they must be able to identify values not included on the table.
* Teachers must include annexure to draw graphs during formal assessment tasks

**PAPER 2**

**COMMON ERRORS:**

* Usage of the diameter instead of calculating the radius.
* The volume of sphere which is calculated by using the formula $\frac{4}{3} ×π× r^{3}$ changed to $\frac{3}{4} ×π× r^{3}$.
* Subtraction of values with different units.
* Verification of the statements not based on calculations as per instruction.
* Conversion of units even when it was not necessary
* Usage of division instead of multiplication method to convert inches to centimetres (question 1.4).
* Instead of using option 1 and 2, option A and B (question 1.4) were used.
* Not able to derive a formula from the given information
* Cents not converted to rand.
* Expressing the probability in the form of a ratio or expressing it in words.
* Not able to deal with unfamiliar context, high order questions and multi-step procedures.
* Unable to divide the rows on the grid in accordance to the given values.
* Not familiar with the pentagon shape and as a result not knowing that it consist of five sides even when it was displayed on the paper.
* Not able to figure out the pattern given on the table in order to calculate the missing values. Not able to even apply trial and improvement method to determine the values.
* Not able to read the map and confused by the orientation of being in a car in relation to left turn into Pelican Road.
* Unable to identify the minimum and the maximum values from the graph based on the data.
* The horizontal section of the line graph for payment option A was not clearly explained.
* Not able to explain why point P was represented by an open circle on the graph using the given context.
* The reasoning, reflection and own opinion questions posed challenges.

**SUGGESTIONS:**

* Problem solving workshops should be organized for teachers.
* PSFs where teachers share good practices should be held.
* Teachers should be trained to set and answer higher order questions (multi-step, reasoning and reflection/own opinion)
* Intensive content workshops particularly on how to teach measurements should be organized during the first term. Practical conversions should be taught as a basis in teaching of the measurements. Teachers should encourage candidates to determine the units that the answer should contain and ensure that conversion is done before any calculation is made. They should encourage them to calculate without the inclusion of units. They should only include them at the final answer to minimize confusion.
* The teachers should help candidates to identify different well known shapes that are embedded within the given irregular shape.
* The difference between a diameter and a radius should be emphasized.
* During teaching, map work and measurement should be used together in some of the informal and formal tasks.
* Teachers should ensure that during the teaching of map work the application of scale is taught properly.
* Map reading should be done with understanding and real life examples be cited for better orientation.
* Candidates should be given the opportunity to give their own direction from their point of departure to a certain destination.
* Teachers should provide candidates with non-routine problems which will allow them to think without any guidance.
* Candidates should frequently be given assessment based on unfamiliar context.
* Candidates should be given the opportunity to read and have discussions about what they have read so that they can be afforded the opportunity to get used to interpreting the context.
* Teachers should encourage candidates to always read the questions with understanding and ensure that they give answers as per instruction.
* Teachers should use assessment from the media and not only from previous question papers and textbooks to present candidates with more opportunities to deal with different types of questioning.
* Candidates should be given a baseline test to identify content gap specifically on percentages and data handling. Data handling and statistics concepts should be revised before every summative assessment. Data handling concepts and terms should be explained thoroughly.
* Teachers should integrate ratio and rates in any question.
* Teachers should emphasize the correct use of the mathematical operations × and ÷ as candidates seem not to know when to apply them.
* To ensure that candidates do not encounter challenges in dealing with questions that require them to work with the information that is in a table form, teachers should provide them with more activities for practice purposes.
* A variety of activities including interpretation of tables should be given during formal and informal tasks.
* Candidates should be exposed to different kinds of graphs, including the once with the exclusive points (open circle).
* Teachers should expose candidates to a lot of activities which entails misleading graphs.
* Teachers should ensure that statistics with bigger values and percentages are used during teaching.
* The concept of probability should be integrated with real life examples coupled with tables and graphs. Teachers must make sure that candidates know that probability can ONLY be expressed as a fraction or a percentage or a decimal.
* Candidates should be made aware that the formula cannot be changed. They can only vary the subject of the formula.
* The teachers should teach the candidates to always refer to the context when explaining break-even point. In this instance the correct answer at point Q should have reflected the explanation for both options’ e.g. cost and time.

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| **REPORT 2: EVALUATION OF THE QUESTION PAPER AND MARKING GUIDELINE**   |

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| **1.** **STANDARD OF THE QUESTION PAPER**   **Was the paper of an appropriate standard for Grade 12?** **Substantiate, using the following  headings:** |

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| 1. **Compliance to NCS, SAG and Examination guidelines.**
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* All the LO’s were addressed in both papers
* Each question covered 2 or more LO’s as required in the examinations guideline.
* All questions were based on real life situations.

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| 1. **Cognitive skills assessed**

Was there an appropriate distribution of questions in terms of low, middle and higher order cognitive skills? (If No, please attach a weighting grid to show the distribution of the cognitive skills assessed) Were choice questions assessing similar cognitive skills?  |

* Cognitive levels were fairly distributed as stipulated by the policy

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| **(c) Difficulty level of question paper**In general, do you think the paper was difficult, fair or easy? Please provide examples with reasons.Were choice questions of equal level of difficulty? |

 **PAPER1**

* In general, the question paper was fair to candidates and each question has the appropriate context relevant to grade 12.
* It is evident from cognitive analysis that questions were fair to candidates.
* However there were some questions that were confusing to candidates, e.g. Q2.3.2 (Petrol Cost), Q3.3.1 (Number of children) and Q4.1.6 (Ratio%)
* Above questions will be explained further in 2 (fairness of questions)

**PAPER 2**

* There were a lot of questions on LO 2 and too little on LO 1 as a result; candidates who are not well conversant with graphs may be disadvantaged.

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|  | **LO 1** | **LO 2** | **LO 3** | **LO 4** | **Level 2** | **Level 3** | **Level 4** |
| Marks | 28 | 45 | 39 | 38 | 35 | 53 | 62 |
| Percentage | 19% | 30% | 26% | 25% | 23,3% | 36,3% | 41,3% |

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| **(d) Coverage of prescribed learning Outcomes and Assessment Standards**Does the paper cover the learning outcomes and assessment standards as prescribed in the NCS? If your answer is No, indicate which learning outcomes or assessment standards were not adequately covered. |

* Learning outcomes and assessment standards were covered according to the policy.

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| **2. FAIRNESS OF QUESTIONS**Were there any questions that were unfair? List them and substantiate why each one was unfair. |

**PAPER 1**

Q1.3.2

* The formula was not provided and hence candidates did not know whether to divide by the new or old price to calculate the percentage discount.

Q2.3.2

* Most candidates divided 2400 by SEVEN which was written in capital letter. This brought a lot of confusion in this question.

 Q3.3.1

* Three years and younger were not indicated in the record of spectator and hence candidate wrote their answer as zero.

 Q4.1.6

* The rounding off the ratio to the nearest whole number was confusing to most candidates and as such the question was not answered by other candidates.
* Even though the Memo caters Q2.3.2 and Q3.3.1 by 1 out of 2, other candidates did not attempt Q4.1.6 at all.

**PAPER 2**

* There is no unfair question.
* Question 3.3.2 required learners to determine the province that had the median percentage as opposed to the usual question from previous papers where candidates were asked to give the median value. It is a fair question though.

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|  **3. LANGUAGE**Is the language used appropriate for Grade 12 learners? List questions that were linguistically complex and show how these questions can be re-phrased.  |

**PAPER 1**

* Generally questions were phrased in a simple and appropriate language and could be

well understood.

* The language used was clear and suitable to Grade 12 candidates.
* The correct terminology was used and there was no evidence of bias question.

However, there were some unfamiliar word to candidates, e.g. 5.2.2 “Visually impaired person” and 2.2.3 “Modus”

**PAPER 2**

* The language was appropriate except that candidates had to read a lot of context which was too much and candidates ended up not knowing what the questions required.

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|  **4. LENGTH OF QUESTION PAPER**Were candidates able to complete the examination within the allocated time? |

**PAPER 1**

* Evidence from scripts indicates that some candidates did not attempt question 6 because they spent more time on some questions.
* There were two questions, Q5.1.3 and Q6.3.2 which required candidates to draw graphs. Some spent time drawing graphs.
* Three tables were given in Q4.1.1, Q5.1.1 and Q6.1.4 which need interpretation and require time for candidates to have a clear understanding.

**PARER 2**

* The length of the questions was acceptable.
* Few candidates were not able to complete the question paper.

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| **5. USE OF APPROPRIATE TEXTS:**  Were the texts/ contexts used appropriately? Substantiate. |

**PAPER 1**

* The contexts used in the question paper were appropriate to candidates. Tables and graphs used in the question paper were practical to real life situation, scenario in question 2.3 was not clear if colleagues are to share the petrol cost amongst themselves Leslie included or not.
* Pictures used in the question paper were visible and clear to candidates.

**PAPER 2**

* There were texts for example; engine capacity, pentagon etc. that were unfamiliar to candidates, but this is according to the policy.

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| **6. MARKING GUIDELINE**Is the mark allocation for all questions appropriate? If no, provide examples. Does the marking guideline cater for all alternative responses? If No, please list all correct responses which were not included in the memo.(Indicate the question number and response.) |

* Mark allocation for all questions was appropriate.
* Marking guidelines entails most of the possible answers.
* In paper 2, most of the memo descriptors did not penalise the candidates for rounding off but advantaged them

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| 1. **RECOMMENDATION.**
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**PAPER 1**

Q1.3.2

* The formula was not provided and hence candidates did not know whether to divide by the new or old price to calculate the percentage discount.

Marks involved: 3 out of 150. 1 mark for credited as CA.

Q2.3.2

* Most candidates divided 2400 by SEVEN which was written in capital letter. This brought a lot of confusion in this question.

Marks involved: 2 out of 150. 1 mark for credited as CA.

 Q3.3.1

* Three years and younger were not indicated in the record of spectator and hence candidate wrote their answer as zero.

Marks involved: 2 out of 150. 1 mark for credited as CA.

 Q4.1.6

* The rounding off the ratio to the nearest whole number was confusing to most candidates and as such the question was not answered by other candidates.

Marks involved: 2 out of 150.

**PAPER 2**

* The systemic challenges (Languages and Mathematics) in the lower grades impacts negatively in the FET band.
* The standard of the paper improved drastically from 2008 – 2013 even though it is in line with the national Mathematical Literacy paper 2 prescripts, the contexts of 2013 paper were complex.
* Based on the analysis of performance, it is evident that candidates were not able to deal with unfamiliar context, high order questions and multi-step procedures.
* According to the analysis, the highest performed question out of the five, is question 1 at 41,5% and question 5 is the least performed at 28,3%.
* The marks of six hundred candidates were captured and revealed that only 17 of them performed above 100 out of 150.
* Therefore an upward adjustment of 3% across is recommended.

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| (a) Raw Marks Accepted |  |
| (b) Adjustment Upwards  | **Paper 1**  | **4%** |
| **Paper 2**  | **3%** |
| 1. Adjustment Downwards
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