EXAMINATIONS AND ASSESSMENT CHIEF DIRECTORATE
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2018 NSC CHIEF MARKER'S REPORT

SUBJECT:	**MATHEMATICAL LITERACY**
PAPER:	**1**
DURATION OF PAPER:	**3HOURS**
DATES OF MARKING:	**30/11-14/12/2018**

SECTION 1: (General overview of Learner Performance in the question paper as a whole)

Learner Performance is discussed basing on the sample of 100 scripts marked at the centre selected randomly.

The general overview of learner performance in the question paper as observed from marking processes and based on a randomly selected sample of 100 scripts for Rasch analysis show a very good performance in the paper. According to this sample 87% passed the paper.
The sample indicate 41% of the candidates in the sample passed at level 4 or better and this is shows an improvement in results compared to last years' results.
The table below and the graph show the performance of learners as from the sample of 100 randomly selected.

Mark	Levels	Score/%
0 – 44	1	13
45 – 59	2	22
60 – 74	3	24
75 – 89	4	20
90 – 104	5	12
105 – 119	6	6
120 - 150	7	3
TOTAL:100		

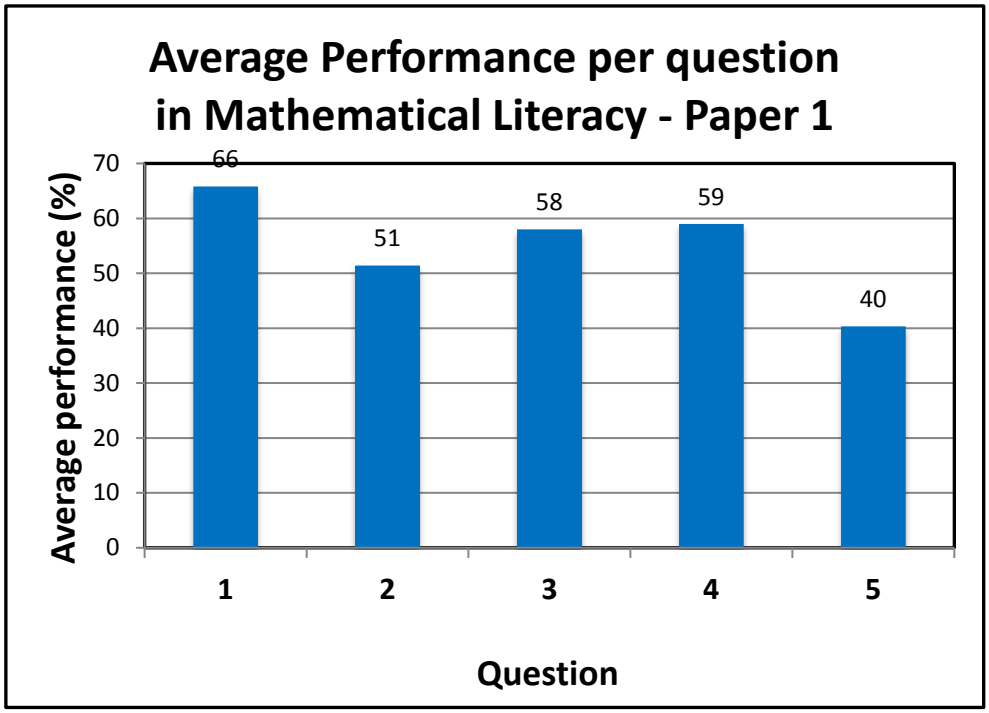
If the above sample is a true representation of the learner population, then better results are expected.
The details of performance in different questions are outlined and analysed qualitatively in **Section 2** of this report
The following aspects contributed to better learner performance:
Language:
The Language used is acceptable to learners with English as home language and to a great extent catered learner with English as first additional language. There a few cases where learners with English as first additional language difficulties in explaining the terms like perimeter, interest, and budget. But these were limited. In conclusion, the language used was appropriate to the grade 12.
CAPS compliance:
It complied with CAPS policy document and implemented the circular S1 with question 1

of 32 marks all pitched at cognitive level 1.

All the topics were covered as outlined in the CAPS Policy document and candidates consequently were assessed fairly.
The cognitive levels were appropriately spread with Level 1 =61,5%, Level 2= 32,6% and Level =5,6%.

The details of performance in different questions are outlined and analysed qualitatively in **Section 2** of this report.

The graph below indicates the average mark obtained by the 100 sampled candidates from the 5 questions.



As explained and expected question 1 is the best at 66% pass. Surprisingly learners performed poorest in Data handling and this was mainly due to their failure to deal with millions and billions that involve many zeros.

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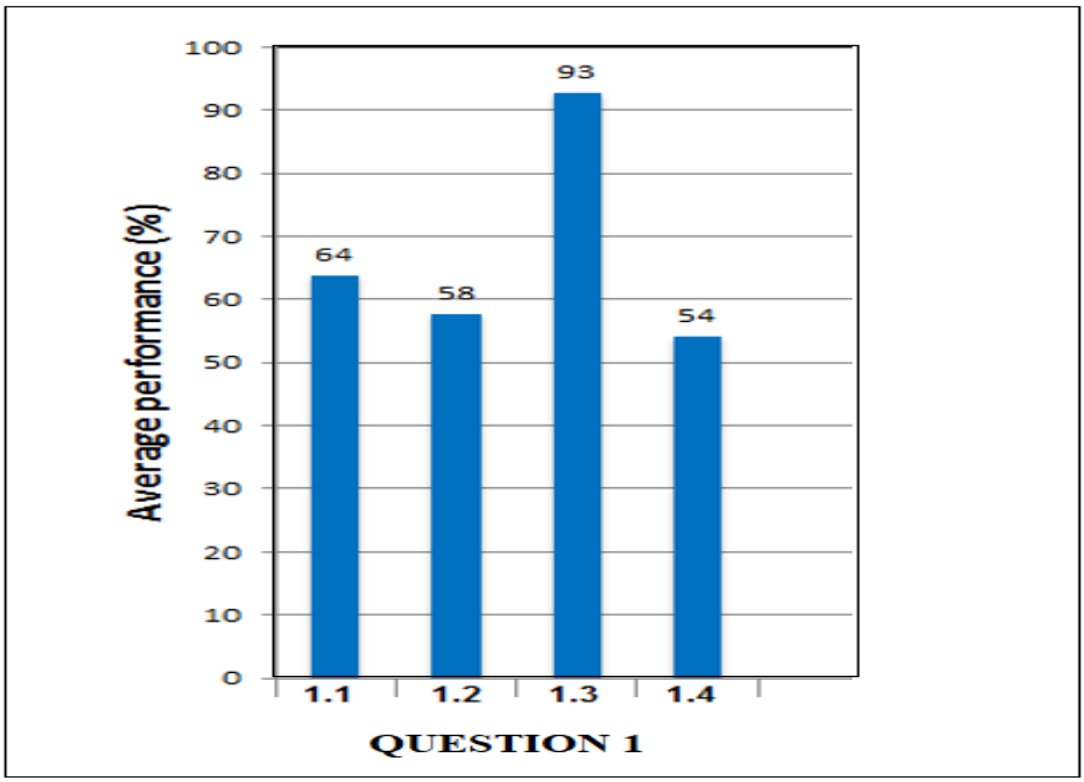
SECTION 2: Comment on candidates' performance in individual questions
(It is expected that a comment will be provided for each question).

QUESTION 1

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

As observed from the above graph learners performed best in question 1 at 66% PASS (the mixed question of cognitive level1).

The details of in sub-sections of question 1 are shown by the graph below:



The learners performed well in 1.3

(b) Why the question was poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- 1.1.1 Some learners were not sure about the number of days as Black Friday in many retail stores extends to 3 days.
- 1.1.2 Learners do not read information on the question paper carefully. That the amount already included the discount they subtract instead of adding.
- 1.1.3 Learners struggle to translate written words into numbers e.g. 50% of the value…
- 1.1.4 Learners cannot **convert**. They divide by 100.
- 1.1.5 Learners were confused with the 2 litres. They just multiplied both by 2.
- **Learners do not read information on the question paper** stating that the amounts
- already includes the discount and therefore they subtract instead of adding.
- 1.1.6 Instead of arranging in **ascending order**, they arranged in **descending order**.
- 1.2.1 Most of the learners managed to calculate the number of letters.

  Some ambiguity concerning whether or not learners had to count ALL the letters once or add the number of letters from the alphabet once (letters repeating counted once).
- 1.2.2 Was fairly answered.
- Many learners did not read/count the increments between the numbers.
- 1.2.3 A poorly answered because some learners would **mix** the **units** in their definition.
- 1.2.4 **Conversion**. Some learners did not convert to mm.
- 1.3 was fairly answered.
- 1.4.1 Learners did not write the answer in hours.
- 1.4.2 Learners were not familiar with the term "discrete".
- 1.4.3 It was answered poorly. Learners used wrong methods to calculate the ratio.
- Learners did not get the order of the ratio correct.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

- Go back to basics. Teachers should not assume that learners know baseline operations. Start with operations, conversions and ratio.
- Practical examples should be done in class.
- Teachers must test learners on terminology using the CAPS document provided by the department.
- Mind the Gap can be used to enforce the basic concepts.
- Exam Type Questions (Past Papers, Study Guides etc.) to be completed during classroom activities

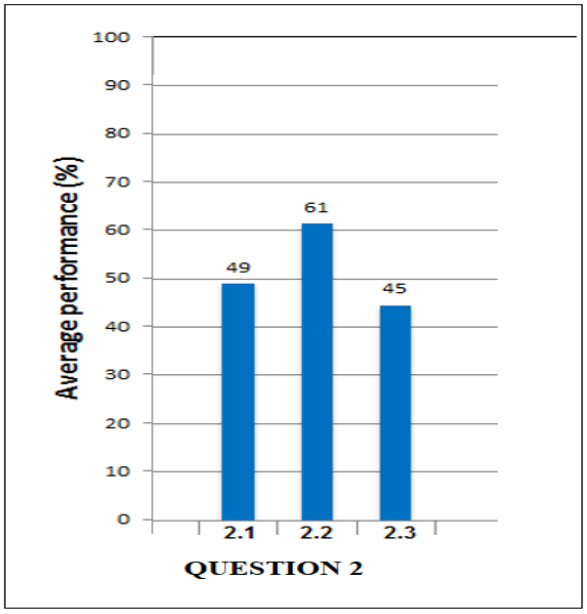
(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.

Teachers tend to teach abstract content. Most mathematical literacy learners need to visualize real life scenarios. Especially measuring. Let them measure with different instruments and use different units and then do comparisons.

QUESTION 2

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

The learner's responses vary. Most learners answered the question at an average level except in 2,2 where the learners performed better at 61%. It is sad to know that there was a single learner who got zero out of 41 marks.
The graph below gives details of the performance in sub-questions this question 2.



(b)Why the question was poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

2.1.1. (Language): Most learners struggled with the definition of interest in the context of late payment of fees, they defined interest in general.

2.1.2 Some learners identified the correct value and then continued doing an incorrect calculation.

2.1.3 This question was generally answered poorly.
Many learners confused the correct numerator and denominator.
Some learners did not understand that they were required to calculate the rate.
Some learners used the incorrect value from the incorrect date.

2.1.4 Well answered.

2.1.5 Fairly answered.

2.1.6 Generally answered well. Careless mistakes were made when values were missed. The question had an element of ambiguity for example certain codes(module) were given twice and learners were confused.

2.1.7 Well answered.

2.1.8 Well answered. The learners explored different methods of answering this question.

2.2.1 Learners also struggled with the **definition of inflation** in the context of the question.

2.2.2 Well answered.

2.2.3 Well answered with a few exceptions.

2.2.4. The majority of learners in this question were sceptical of writing 29 900%, some were tempted to write it in Rand etc. they continued with an incorrect calculation (divided by 100).
Some learners did not substitute correctly into the given formula.
A few learners changed the given formula.

2.2.5 Poorly answered question.
Learners have difficulty converting a selling price to a cost price.
Learners have difficulty with the concepts of inclusive and exclusive values.

2.3.1 Well answered except for a few learners who chose to write ONLY the value instead of just the letter B. Consequently, they missed the zeros. Confusion amongst the Afrikaans learners concerning the terms "million" and "milliard".

2.3.2 It was also difficult for many learners to **define budget.** Most of learners confused the concepts **budget** and **saving**.

2.3.3 Well answered.

2.3.4 This question was answered fairly well, although some learners just chose the incorrect option.

2.3.5 Poorly answered question. Learners are reluctant to make **estimations**; they want to make calculations.
The question had an element of ambiguity since estimations usually involve a rounding in the process of doing your estimation.

(c) Provide suggestions for improvement in relation to Teaching and Learning.

- A variety of financial documents must be done by teachers to address various aspects like proving how a value is calculated as in the case of question 2.1.5.
- Emphasis must be laid on the **conversion of units** from rand to cents as required by question 2.2.2.
- In each topic, basic concepts must be taken care of to help learners cope with questions that require definitions of terms. The Mind The Gap Study Guide has the variety of concepts that can help in this regard.
- Teachers need to explore a variety of contexts when addressing each topic in Mathematical Literacy.
- Basic Mathematics skills like **BODMAS** must be properly addressed.

- Substitution in formulae. Learners must be drilled in substitutions especially in calculating percentage increase or decrease.
  Learners have to be taught how to calculate a selling price to a cost price and a VAT
  inclusive price to a VAT exclusive price.

(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.

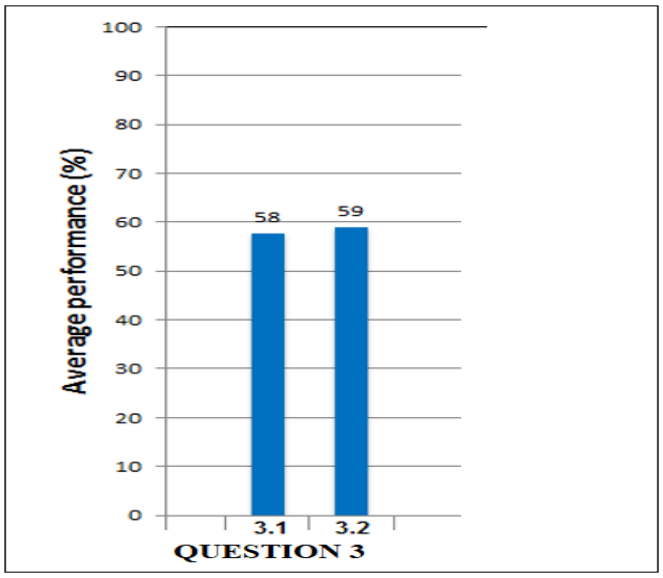
- The inclusion of correct units in answers has to be taken care of.
- Showing detailed calculations has to be encouraged.
- Rounding: (according to a given context) to a specific number of decimal places has also to be considered very seriously by the teachers.
- BODMAS

QUESTION 3

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

Generally, the question was answered fairly. Most learners got less than 10 out of 18 with a few that scored 0 and a few 18 out of 18.

Results of performance from the sample in the sub-questions are shown by the graph below.



(b) Why the question was poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

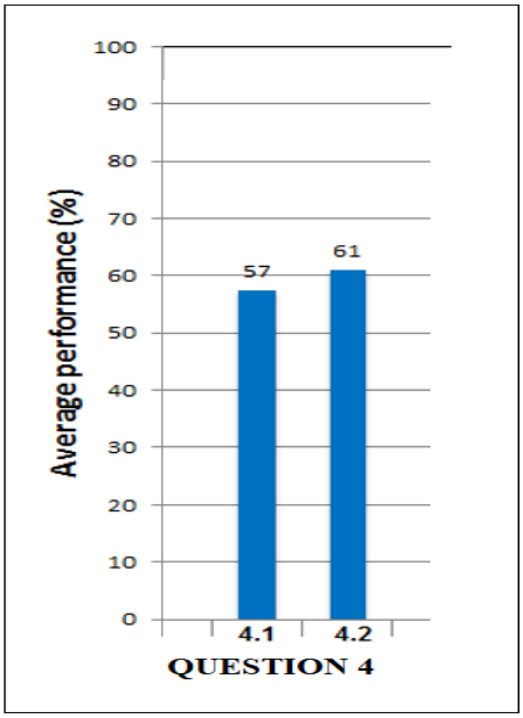
3.1.1 Question was answered fairly but some learners were unable to **convert** *cm-mm.*

3.1.2a) Question was well answered. Some learners were unable to differentiate between radius and diameter.
3.1.2 b) Question was poorly answered. Unable to write correct height and instead of squaring, they multiplied by 2. Using phi on the calculator instead of the given value of 3,142.
3.1.3 Most could not **define perimeter**. Some learners have an idea of perimeter, but do not have the language proficiency to describe it in words.
3.1.4 Could not substitute correctly. The learners do not read the question, because they use the wrong cake's measurements and/or do not know what height, width or length is (language barrier).
3.2.1 Most learners did not know the value of 3 and a *half* or just ignored the "half" and only used 3. Some learners multiplied by 2.25 instead of dividing. A lot of learners lost marks, because of incorrect rounding.
3.2.2 Generally well answered (most learners with incorrect answers divided instead of Multiplying). Some learners rounded incorrectly, not considering the context.
3.2.3 Generally well answered (most learners with incorrect answers would either change the given formulae completely or they would omit the comma in 1,8 or the brackets). BODMAS ignored.

(c) Provide suggestions for improvement in relation to Teaching and Learning
Before teaching definitions, learners should first comprehend measurement by physically measuring perimeter, height, width, length etc. They should give all answers in (mm) and (cm) so that they can SEE the difference. Then the definitions can be derived (in their own words) from what they have seen first-hand. Educators should give the correct definitions only after the learners comprehend the meaning and then learners should LEARN these definitions.
Educators should analyse questions with learners to help them through the process of answering questions, highlighting core words in each question.
The use of the scientific calculator must be encouraged.

(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.
Teachers should stress that learners must not use the word of which the definition is required, in their definitions as that does not indicate whether the learner knows the meaning of the word.
Inability to use calculators.
Incorrect rounding.
Incorrect substitution in formula.
Language is still a major barrier.
There were some learners who wrote the correct method, but got the totally incorrect answer.

Some learners do not understand where the comma should be when using calculators with thousands separators.
(e) Any comments useful to teachers, subject advisors and teacher development
Workshops be held to help educators to understand some of the skills and to share best practices. Lead Teachers (for example Markers of NSC Examinations) should play a leading role in this regard. These workshops should be conducted early in the academic year.
Educators can support each other by visiting each other's schools and teach learners difficult concepts. Cluster groups to be formed.
Stress the importance of using the CAPS document when teaching as all the text books do not always include all the content as stipulated in the CAPS document.
Subject advisors should also help teachers at schools and provide extra useful material where possible.

QUESTION 4
(a)General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
4.1.1 This question was answered fairly. Learners gave mixed directions e.g. NE – SW. It must be emphasised that learners (especially Geography learners) must only use the 8 points of the compass. Point of reference (to and from) must be emphasised. The graph below shows the average performance in subsections of question 4. 
4.1.2 Very well answered.
4.1.3 Generally very well answered.

Some learners start with the correct/wrong town then the rest are wrong/correct. Some learners did not follow the instructions and identified more than two towns. Others identified towns outside the N14.
4.1.4 Well answered question. Some learners answered Bar Scale, Map Scale, Linear Scale etc. Learners give the general meaning of the scale instead of the meaning in context.
4.1.5 Units are NOT written in the correct measurement. Learners measure in mm, but give the answer in cm or even in km. The skill of converting from mm/cm to km is still lacking. The learners did not use the given scale (x 3 007 874). Most of the learners did not follow the instruction to round off to the nearest km.
4.2.2 Well answered. Some learners did not follow the directions (right/left).
4.2.3 Well answered.
4.2.4 Question was poorly answered. Conversion from hours to minutes posed a challenge. Some leaners interpreted 3,51 minutes to be 3 hours and 51 minutes or 3 minutes and 51 seconds. $\frac{2,34}{40}$ switched $\frac{40}{2,34}$ ⇨ 3h 51 minutes; 3.5 min1 etc.
4.2.5 Fairly answered. Some learners did not fully understand the question. Common mistakes (42 – 29 = 13 and stop there).

(b)Why the question was poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
4.1.5 Poor performance based on conversion of units mm/cm to km. When substituting, the learners should keep the units.
4.2.5 The concept of probability in a fraction form $\frac{13}{40}$ ⇨ 13:42; 13/42; etc. Expressing probability correctly (fraction, decimal, percentage), but **NOT** as a ratio.

(c) Provide suggestions for improvement in relation to Teaching and Learning
Teaching should emphasize the "King Henry…" to memorize the conversion strategies.
Learners should know the method of **converting** from the smaller to the larger unit and vice versa.
Teachers should use previous question papers. Assessing the learners using criteria that is the same as the criteria in the final grade 12 question paper.
Teachers should make use of the CAPS documents and policies and approved CAPS textbooks with real context based examples and practice questions.

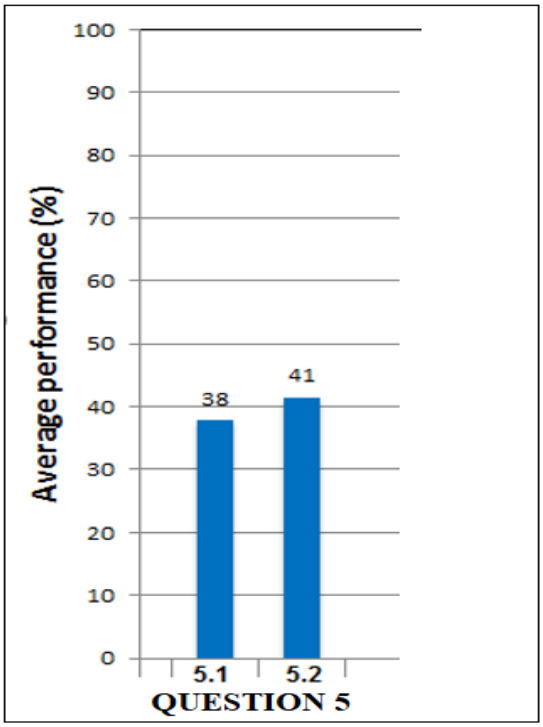
(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.
4.1.1 The learners must be taught to work FROM the point of reference. The concept of "give the general direction" which means with reference to west, north south, east are confused to mean "give directions" to get to a certain place. Learners must be encouraged to draw the cross on the point of reference on the map.
4.1.5 **Conversion of units** of measurement of length i.e. mm/cm to km or vice versa. Learners should measure accurately from "centre to centre". Error of **parallax** should be avoided. Measurement must be done **practically** in classroom.
4.2.4 **Conversion of time** i.e. a decimal hour into minutes.

(e) Any other comments useful to teachers, subject advisors and teacher development
The advice is to teachers to maximize on contextual class exercises.
Content workshops are encouraged per term topics.
Educators should develop a resource pack (worksheets, material together to be used by all educators across the board.
Teachers must start developing their own questions immediately after a section has been completed.

QUESTION 5

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

Question 5 was poorly answered. Many struggled with large numbers involved. Some has a problem even choosing values from the table due to language barrier.



Some did not understand the concept of ratio and percentage. It was also worse with defining unemployment. Even though they understand unemployment but cannot define using correct language.

(b)Why the question was poorly answered? Also, provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
5.1.1 The question was answered poorly. They struggle to write large numbers (millions and billions) correctly. Some types of calculator provided by The Department of Education represent the numbers incorrectly.
5.1.2 The question was answered poorly. Some confuse mean with median. From the given table. Some learners did not identify ALL the values.
5.1.3 The question was well answered. Some learners lost one mark for omitting the 1000.
5.1.4 This question was answered poorly. The fact that the numerator was in millions and the denominator in a thousand million confused the learners. Rounding to TWO decimal digits proved to be challenging for some learners.
5.1.4 & 5.2.4 They also have challenge of interpreting the table.
5.2.1 The question was fairly answered. Common mistakes – Using slang to explain the concept. - Describing unemployment as to being unemployed. - Not considering the context in explaining the definition/term.
5.2.2 The question was fairly answered. Failing to **read** the correct value **from the table**.
5.2.3 The question was poorly answered. Learners did not identify the **INSTRUMENT** used.
5.2.4 The question was fairly answered. Learners have difficulties calculating percentage and identifying values from a table.
5.2.5 The question was fairly answered. They struggled to write the ratio in the form of ……: 1
5.2.6 Poorly answered. Identifying the correct values from a table.
5.2.7
5.2.8 Poorly answered. Learners found it difficult to identify the number of provinces as the values in the table were given in thousands. They struggled to calculate probability and give the answer as a simplified fraction.

(c)Provide suggestions for improvement in relation to Teaching and Learning
Learners must be given more activities using big numbers (millions and billions). Give them more activities to find mean and median, so that they can differentiate it well.
Interpretation of tables in different context is also important. Give more emphasis on **ratio**, **percentage** and **probability.**
Teaching strategy: 1 …….. unit 10 ……. Ten 100 ……. Hundred 1000 …….. thousand
Teach learners to read and understand which value should be the numerator (target aspect of the question) and which value should be our denominator (sample space).

(d) Describe any other specific observations relating to responses of learners and comments that are useful to teachers, subject advisors, teacher development etc.
1. They struggled to write and work with large numbers.
2. They are confused with mean and median.
3. They have challenge in interpreting and reading from a table.
4. They struggled in simplifying ratio and also calculate the probability.
5. Learners also struggled to define unemployment due to language barrier.

(e) Any other comments useful to teachers, subject advisors and teachers' development
Learners must be given more activities where they can interpret tables with challenging contexts.
Learners must be also given more activities about probability, ratio and percentages.