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NSC 2011 CHIEF MARKER'S REPORT

SUBJECT	Mathematical Literacy

PAPER	2

DATE OF EXAMINATION:	31 October 2011	DURATION:	3 hours

SECTION 1:

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

An analysis of 150 scripts was done. The results display an average of ±33% for the question paper, for the selected sample. It must be remembered that this is based only on the selected sample. The scripts were selected from all the districts and at least 2 – 3 scripts were selected per districts. In the bigger districts the sample exceeded 3.

In my analysis of the question paper and marking guideline I concluded that the learner should at most obtain an average of 60% for the question paper should they manage to score all the marks awarded at level 2 & 3.

If we take into consideration that a learner could have obtained at most 42% in question 1.4 and 5 then the sample analysed shows that this is not the case.

If we study the analysis it is evident that Question 2 and 4 were the problem questions as learners did not score well in these questions. Question 5 still seems to be the question where the learners scored most of their marks even though 20 out of 42 marks were set at level 4.

It therefore means that in question 2, where learners had to work with tables and interpret quotations presented a challenge for them. The use of ratios, rate and percentages in various contexts is still a problem. Learners are also unable to do simple conversions from hours to minutes and struggle to work with percentage especially with regards to the section where they were asked to determine the amount with VAT excluded.

Question 4 tests the learners' knowledge of space and shape. This section has always been poorly answered by the learners. It therefore seems that teachers still have problems either teaching this section or they find difficulty in preparing learners to answer a variety of questions relating to space and shape. It is also clear from the analysis of the sample of 150 scripts that this question reflects the worst performance by the learners in the entire question paper.

SECTION 2:

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

QUESTION 1
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

In Question 1 the final statement specifically mentions that the person will only earn money should he work for one or more days. This statement confused many learners because the R3000 in the formula for the medical sales representative (R3000 + 500 × number of days worked), was taken as a basic amount paid. As a result they started plotting their graphs incorrectly. This once again reflects the lack of understanding on the part of the learner of the language (English) used in the paper. Teachers must be aware that the papers are edited by language experts therefore teachers must ensure that they allow their learners ample opportunity to read and interpret various scenarios even if English is not their first language.

This seemed to be the only part of the question that learners had difficulty interpreting. In some centres the question was answered well with learners obtaining 3 marks short of the maximum mark in question 1. There were, however centres where the question was poorly answered, this is evident when looking at the sample of 150 scripts where 2 learners obtained 0 marks. Evidence from some of the markers reports also pay testament to the fact that there were cases where the question was poorly answered by learners.

Markers discovered that the learners had difficulty plotting the graph and reading off the break-even point on the graph. It was also evident that learners still show a lack of skill in sketching a simple graph. In question 1.1.1 learners battled to answer as they clearly expected the equation/ formulae to look exactly the same as the given formula and therefore learners struggled to think of the correct formula for ABC Cigs independent of Meds SA.

Question 1.2.1 also revealed the lack of interpretation of the language as learners did not work out the return distance for travelling costs. The question mentions how far the workplace is from home as result learners had interpret the question and work out for a return trip. Learners did not only struggle with understanding the language they also clearly rushed through this question which is unnecessary as there is more than enough time allocated. The

majority of learners were able to select the correct choice but were unable to justify using calculations. This proves that learners are not using the instructions given in a question.

The big concern with regards to learners' performance in Question 1 is their lack of understanding what is being "asked". In Qu 1.2.3 in particular a misleading graph was given and learners were supposed to "criticise the manager's statement" with reference to the graph he used. Most learners battled with this and were unable to answer correctly. They misinterpreted the question and also were unable to articulate their answers successfully.

The performance by the learners in this question varies from good to bad. It seems however that within the centre the performance in the question will be constant. If it is good then most of the learners perform well, if it is bad then most of the learners perform poorly.

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

The question was poorly answered because of learners' competency with regards to English as the language of instruction and also as one of the languages in which the paper is set. Learners, especially those for whom English is a second language find it difficult to correctly interpret the scenarios set out in the questioning and at the same time are challenged when they have to explain their answer in writing in a language that is not their home language.

Learners also battle with simple sketching of graphs from a formula. All they needed to do was to substitute values into a calculator or do it manually since the points were given on the annexure with the graph paper. Learners also battle to obtain answers from their graphs. The skill of reading from the graph must be taught and mastered by all.

In 1.2 the learner is given another scenario which requires reading, understanding and interpreting. Learners need to be taught to read a scenario more than once. The first reading is just to get an idea of the scenario. The second reading is done in depth so as to identify the information given that will be used to solve the problem. A third reading will allow the learner then to use the important information noted and to identify what the question requires. Teachers of learners for whom English is a second language must apply this method in class so that learners become accustomed to it. If the learner had read the scenario thoroughly the error of not making use of the return distance would not have been made.

In 1.2.3 the misleading graph is tested and from the evidence gathered; not only from the sample of 100 scripts but also from scripts marked and moderated it is clear that misleading graphs are not dealt with in our schools. The learners misunderstood the question and therefore their justification is not based on the misleading information presented in the graph. This can only be as a result of lack of exposure in class to these types of questions.

(a)   Provide suggestions for improvement in relation to Teaching and Learning
In question 1, the learner is expected to draw graphs from formulae given as well as formulae "derived" by learners. It is important that learners be taught how to correctly derive the formula as well as how to sketch these types of graphs. Learners should also be taught that should they use a variable in the formula that they have to derive, they should also explain what the variable means. This does not mean that learners <u>must</u> use a variable, but if it is easier for them to use a variable rather than explain in words then they must explain what the variable is being used for: **e.g. 750 x number of days OR 750 x n, where n is the number of days worked.** **In terms of Question 1.2 learners need more exposure to calculations involving rates and percentages. It is also advisable to expose learners to terms like maintenance costs and travel costs linked to consumption rate, in particular learners who may not have sufficient experience or exposure to these terms.** **It is also imperative that we emphasize the importance of teaching learners not only how to find the errors in a misleading graph but also to be able to explain why the graph is misleading. Questions of this nature should form part of regular testing as well as be included in formal examinations.**
(d)   Describe any other specific observations relating to responses of learners
Learners find it difficult to make that informed decision about what is the best for them. In Qu 1.2.1 for example they have to make a choice between the two job offers on the basis of the calculations they make with regard to the extra expense costs incurred by one of the job opportunities. **Learners answered on a personal level instead of arguing their choice on the basis of the calculations that were made. Learners often do not also know how to make that informed decision and just make a decision on the basis of more money and never consider that the money could be used up in the travel cost.** **The skill that needs to be taught is the critical analysis of the answer. How does the answer impact on my decision, can I justify why I am making that decision. For example would I accept a job on the basis of earning R2000 more and then pay more than that amount on travels costs.** **These are all life skills which the learner will then learn to make.**
(e)   Any other comments useful to teachers, subject advisors, teacher development etc.
In order to make sure that these recommendations reach all the centre in our Province, it is important that Subject Advisors visit the schools after studying the recommendations in the report and make teachers aware of them. **Teacher should insist on guidance from the subject advisors as well as from colleagues who have attended marking sessions and are aware of the common errors made by the learners.** **Subject advisors should also check whether the question papers set at the schools comply with the requirements as set out in the examination guidelines.**

It is also important for subject advisors and teachers to ensure that they have all the relevant documents necessary to assist them and guide them when setting up their own assessment instruments. Teachers need to make use the past papers set at National level and at Provincial level to guide them in both their teaching and in their assessment of their learners.

Make use of teachers at cluster level who have achieved good results over the past years to assist in these areas where the learners are experiencing problems.

QUESTION 2

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

The question tested learners' ability to work with rate, conversions and graphs. The responses received from the learners were not good. There is clearly a problem with regard to learners' ability to understand the concept of rate Qu 2.1.1. This is simple division and still learners were not able to answer the question. It seems that learners did not understand what was expected of them because they had to use values which were in a table format. They therefore battle to read off the correct value needed for the calculation. It is obvious that most learners did not understand the meaning of rate which is the amount per unit of time divided by time.

The responses to the percentage reduction Qu 2.1.2, where learners had to calculate the amount excluding VAT from an amount where the VAT was already included was very poorly answered. Clearly the learners in most centres were either not exposed to this type of calculation or where never asked to solve percentage reduction problems making use of VAT. This is concerning because VAT was also examined in the trial and this means that learners were not assisted in terms of feedback on their responses in the Trial examination.

In Qu 2.2.1 & 2.2.2 it is clear that learners struggled to read from graphs that were given. The question was set in a simple manner, the language was clear but the responses reflect that learners are unable to read from graphs. This can also be attributed to the fact that they do not understand the scale on the axes of the graphs and therefore find it difficult to read off an answer in between the given values.
It is also evident that learners are unable to do conversions. This was a simple conversion from hours to minutes and still the responses were poor.

In question 2.3 no proper reasoning was given by the learners and they could not understand the concept of best buy or best value for money i.e. replacing a tow bar is much better than replacing the towbar. Most of the learners gave the correct choice in question 2.3.2 – Gail's Panel Beaters but could not give the appropriate reasons implying value for money.

This question carried the least amount of marks and yet learners failed to obtain a good mark for the question. 13 of the 19 marks in the question were set at level 2 & 3 and should have been more than obtainable for the learners.

In 2.1.1 the learners clearly did not understand what was asked. They confused the first part of the question which says," without doing any calculations, Ms Vermaas stated that …..", with the last part of the question which clearly says show ALL calculations. This can only be attributed to the language barrier and the lack of understanding and interpreting a question.

Learners need to learn to identify the difference between information provided and the question asked. Learners also did not understand what was required and confused using the tables for information needed to calculate the rate by adding up all the values in the table of quotations. This also provides evidence of the lack of the learners' ability to read off information accurately from a table. As well as the ability to correctly use the information in the table.

In 2.1.2 the question asks for the calculation of the amount excluding VAT. Most of the learners did not know how to answer the question and most of the learners calculated the VAT of the amount that included VAT.
 Learners also needed to use the table given in the question as well as the table given in the annexure to do the calculation. It is clear that learners did not understand that the question asks for percentage reduction.

In 2.2.2 it is clear that the learners do not know how to read off values from a simple graph. It was disturbing to note that the simple conversion of hours to minutes presented a challenge for the learners. This section constituted 5 marks, easily obtainable if the learner was able to correctly read off the values from the graph, subtract the two values and convert their answer to minutes.
In 2.3.1 it is evident that learners struggle to successfully articulate their justification for the choice. This can once again be attributed to their linguistic competence in English.

It is strongly suggested that learners be given exercises which tests their use of percentages as well as the calculation of rate. Teachers should make use of everyday examples to expose learners to the type of scenarios expected. Even learners from the more rural areas can easily be exposed to rates and percentages since it is a simple context it just needs to be understood. Once a learner has a grasp of what a percentage is and how he can use it or determine it whether it be increase or decrease he will then develop the skill of applying his knowledge. Teachers must also remember to teach both the percentage increase as well as percentage decrease.

Integration across the different learning areas can be applied here. Teachers can make use of the English teachers to teach reading and understanding of basic texts. It would also be advisable to use the Accounting teachers to assist with the teaching of the calculation of VAT and the use of percentages.

Teachers should also make use of exam type questions from various Provinces when they teach the concepts in the classroom. Teachers must remember that the aim is to teach conceptual understanding and also the application of this conceptual knowledge. Simple concepts like conversion of time can be easily taught and consolidated using various types of questions.

It is also distressing if we consider that VAT was examined in the Trial Examination of 2011 in our Province and still so many learners performed poorly. We can only conclude that learners trial papers are not discussed with them after they have written. This is feedback that can only benefit the learners. I strongly suggest that this practice be followed in the future.

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

The most striking observation in this question is the learners' calculation of VAT on the price that includes VAT. Most of the learners made this mistake, which means that they do not have an understanding of the concept of percentage decrease and neither do they know when to apply it or how to do the calculation.

Another common error occurs in Qu 2.2.1 where learners are unable to give the points on the graph in coordinate form. While the memo did provide for this learners need to be taught how to read off a point and then how to represent it in the form of a pair of coordinates. This process of teaching them to read off points correctly will also assist in them when they have to plot graphs.

In Qu 2.2.2 the common error is incorrectly expressing time. Learners confuse the concept of 3hr:12min with 3,2hrs as a result they subtract the two different forms from each other and end up with the incorrect answer. The conversion of hours to minutes is also not done correctly some learners tend to divide by 60 instead of multiplying the decimal by 60.

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

In order to achieve better results from the learners it is important that the teachers make sure that they themselves understand the concepts that the learners are battling with. Teachers should not hesitate to request assistance from the subject advisors with regard to "difficult" or "misunderstood" topics.

Teachers should also try as far as possible to firstly teach learners the concepts and make sure that they understand what the concept is, where it can be applied and why it is applied or used in the calculation. Once you are confident that the learners are comfortable with the concept then you set problems for the learners to apply the knowledge that they have acquired.

It is also important for teachers themselves to develop confidence in the subject. Teachers can only empower themselves if they are willing to learn from mistakes and willing to ask for assistance. Mathematical literacy entails reading with understanding but it also requires that both teachers and learners have a firm grasp of basic Mathematics taught in the GET phases. Teachers who have not taught Mathematics before and are now teaching Mathematical Literacy must empower themselves with the basic knowledge in order to successfully pass it on to the learners.

The Mathematical Literacy, requires that we know our basic Mathematics and are able to apply it at various levels and in various manners. Subject advisors play an important in the support of schools where teachers are not sure about the subject. The subject advisors need to make use of the more experienced teachers in the district to empower and share there expertise with these teachers. Subject advisors should insist that the learners receive feedback with regards to their Trial Examination. This will assist learners in cases where they have performed badly in a specific topic in the Trial and that topic is asked in Final Examination again.

QUESTION 3

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

This question dealt with the measuring of distance between two towns on a map and making use of the given scale to determine the actual distance between the two towns.

Although this is the question where we expected problems, if you look at the average obtained from the sample of 100 scripts the performance of the learners in question 3 is better than the performance of the learners in question 4 and 2.

In some of the centres where the performance was poor it is evident from the learners' responses that they were not able to handle the question. The question should then be asked is this aspect taught in our schools.

The fact that the scale was not accurate on the copies used in the Eastern Cape could have also caused the stronger learners to panic and therefore they made slight errors. Other learners simply had no idea of how to make use of the scale with the result they lost a maximum of 5 marks.

In question 3.1.1 learners did not struggle with measuring distance and finding the acceptable range however very few learners could read the scale correctly and many used 0.8 cm to 100 km while only a few learners used 2 cm to 300 km. Photocopying of the new paper could have caused the shift in the scale.

The poor performance in this question is reflected once again in 3.1.2 where the learner has to work with time as "hours:minutes" and as a decimal. Learners know the formula for speed but they are unable to work correctly with the units involved. They need to be taught that the units should be the same when dividing. They also need to know that speed is a rate (km/h) therefore when dividing or multiplying with time it has to be in hours.

In question 3.1.3 the performance also varies because learners do not finish off their calculations. They forget to take cognisance of the mark allocation for the question and therefore do not do all the calculations needed to justify the answer at the end. Once again we are working with rate like R/l of petrol and learners need to understand what happens to the units when we divide or multiply. In 3.1.3 b the performance in general is poor because the learners did

not understand the consumption rate. Learners were unable to write the words "9 litres per 100km in the form of a fraction, with the result most learners divided by 9 but forgot to multiply by 100.

Qu 3.2 didn't present a problem for most learners there was however a few cases where the learners were unable to identify the national roads correctly and also took the longest route.

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

Question 3 was poorly answered because the learners struggled to measure the distance accurately right at the beginning. The scale on the map was not accurate and therefore learners had to work with a scale that they may not have been used to. For example problems dealt with in class tend to have a similar ratio for different maps, so the learners are used to the accurate numbers on the scale. As a result the stronger learner could have panicked and made mistakes.

Qu 3.1.1b carried a weight of 5 marks, yet some learners clearly made use of the method of measuring with a ruler on the map or a piece of string because it was a winding road. Learners then use the method of placing their ruler with the pencil markings on the scale and mentally calculate the distance correctly but show no calculation of the values and therefore write down only the answer, for which they would expect 5 marks.

In Qu 3.1.2 once again learners make the error of dividing into the speed with hours and minutes, instead of converting the time to hours (decimal) and then dividing so that the units are able to cancel and the answer can be presented in hours or km.
Learners should also learn to use their answer to justify at the end of the question and not to simply rewrite or rephrase the question. For example: "Determine whether they arrived at their destination at the predicted time." Learners answer may not reflect this and therefore they made an incorrect calculation somewhere but they must now justify according to their answer and not simply rewrite the question. This is a common error in all questions where learners are expected to justify or verify their answers.

In Qu 3.2 learners are unable to accurately follow a route on a map. Some learners went in the opposite direction; others went completely off the track. The responses from some learners were "drive straight to Upington", this is how learners visualize the shortest distance for a trip. This problem can once again be attributed to the lack of understanding of English especially for the learners where English is a second language.

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

In order for learners to gain confidence in the aspect of measurement teachers should integrate with Geography teachers so that learners and teachers are fully capacitated with the methods of measuring distances and application of scales to measurements.
Make use of the contexts used in Geography when teaching the measurement and calculation of scales. This allows the learner to be aware of the integration of subjects as well as developing the learners' life skills.

In Qu 3.1.1b teachers must ensure that when teaching learners to determine the scale that they insist that the distances be shown. Learners must develop the practice of writing down the values and showing the addition. If this is practiced in class then the learner will apply this in the answering of questions in an examination set up. It would also be advisable to introduce penalties in tests or examinations that are internally set by the school so that learners are prepared for external examinations. This practice can be introduced as early as grade 10.

In Qu 3.1.3a learners tend to do half of the calculation needed to justify the answer and expect that the marker will read between the lines. Teach learners to look at their answers together with the mark allocation and to ensure that they have fully answered the question asked.

When teaching the use of rates make learners aware of what happens when we divide with R/l. If learners are shown how the units will cancel they will understand why the answer will now be in litres. Learners often multiply values together but then they are not sure what units the answer must be in, for example if they are calculating the cost of petrol it can only be in Rands.

When we work with route maps show learners on a bigger map how to follow a route. A simple introduction to following a route on a map is the use the floor plan of the school building or the floor plan of a supermarket. Learners even in the rural areas have to visit a shop or mini-market of some sort and they have to look for items in the aisles. Teachers can even make use of the simple context of drawing your own route to school, whether you travel by car or walk. This allows learners to get a sense of direction and then when introducing a map of a Province they feel more confident to follow a road and to travel in a certain direction. Once learners are comfortable with simple route then introduce the concept of national roads and how they are indicated on maps.

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

In Qu 3.1.1 a common observation is that some learners give the measurements in km. Learners also multiply the measured distance with 300km instead of simplifying the scale into 1:150 and then multiplying the measured distance with 150, in 3.1.1b. This is an indication that the learner does not know what to do with the measured distance and the scale.

In Qu 3.1.2 the common error is once again representation of time in terms of hours and minutes. Learners forget to convert the minutes to hours and then multiply with the hours and minutes.

In Qu 3.1.3a learners do not complete all the calculations needed to fully answer and justify the question. As a result learners could lose marks if they give their justification based on minimum information. In Qu 3.1.3b learners did not know how to use the consumption rate as a fraction because it was given in the form of words in the question, as a result learners divided by 9 only and did not multiply by 100.

In Qu 3.2 most of the responses were satisfactory even if the full answer was not given but in some cases there were learners who came from the opposite direction, i.e Upington to Port Shepstone.

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

It is of utmost importance that I emphasise the teaching of measurement in all forms. Learners have to be exposed to route maps and have to learn the practical application of measurement together with the use of scales.

Teachers should make use of the Geography teachers at their schools to assist with the teaching of scales on maps and measurement. Subject advisors should encourage teachers to integrate with other subjects so that the development of the child can be done as a whole.

Subject advisors should identify how many schools performed poorly in this section or make a survey of how many teachers need to be capacitated in this section and arrange a workshop or training with regards to this section. This type of question will always be set and therefore it is important to ensure that everybody is more than capable of handling this section.

Teachers should also ensure that they tell their learners to look at the calculations that they have done together with the mark allocation and make an informed decision as to whether the calculations done using the information given is adequate. This comment is made because of Qu 3.1.3. Many learners only calculate the 45 litres and then just rewrite the sentence making a judgement about whether the gauge is working or not. They needed more to substantiate their justification. Teachers must encourage learners to do all the calculations they feel is necessary to fully complete their answer.

QUESTION 4
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Question 4 is the question which from the analyses of the 150 scripts as well as from personal marking and moderation is the most poorly answered in the entire question paper. Concerns about the poor performance in space and shape have been voiced over previous years but there is no sign of improvement on the part of learners.

Learners' response to the question on general direction is also poorly answered. So many learners used the position of the window in relation to where the indication of North was given.

Learners did not struggle to find the correct direction for 4.1 – downwards, South, Southerly or South West.

In Qu 4.2 the learners did not do so poorly but many of the learners forgot to convert their answer to metres. Most learners used the area formula correctly but could not (i) Do proper conversions of units; (ii) Calculate the 109% of the area of the door as well as (iii) Rearrange the formula to calculate the width.

Question 4.3, which totalled 10 marks was very poorly answered, almost the majority of the learners started off incorrectly. Learners started off by calculating the area of the floor of the bedroom. This is also an example of reading but not understanding what is required. The allocation of marks should also have guided the learners to understand that the question required more than one simple calculation of length X breadth. The question was clearly set out and included a comprehensive sketch which included the spaces where the windows and the doors in the bedroom were positioned. The question clearly states calculate the area of the inside walls of bedroom 2. Learners who calculated the area of the floor just read area and bedroom 2 and incorrectly calculated the area of the bedroom floor/ceiling. All the dimensions for both the walls, doors and the windows are clearly stated in the information supplied.

Qu 4.3.2 was not as poorly answered except that some learners forgot to divide twice to calculate litres of paint first and then to calculate the amount of tins of paint. This can once again be attributed to learners' linguistic abilities in the lack of understanding that they had to convert the litres into tins of paint.

In Qu 4.4 learners make the common error of calculating what 50% of the normal time is for Saturday but they forget to add it to the time for Saturday. Learners had difficulty excluding or including the increased or decreased percentages in their calculations.

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

Question 4 tests the understanding of space and shape. It has over the past examinations always been the section that has been poorly handled by most learners. It is not an easy section in Mathematical Literacy to teach but it must be done and teachers need to ensure that they empower themselves in order to assist the learners adequately.

Qu 4.1 was poorly answered because learners do not know what general direction means. Learners take the position of the bedroom in the drawing in relation to the position of the compass and they give the answer of South West.

Qu 4.2 calls for a conversion from centimetres to metres. A common error which most learners performed was forgetting to convert their answers. Learners also commonly confuse the conversion of cm to m with cm^2 to m^2 and therefore arrive at the incorrect answer.

In Qu 4.3.1 the most common error is to calculate the area of the bedroom floor. Learners did not interpret the section total inside wall area of the bedroom 2 correctly. Linguistic ability also plays a role here in that the learner was hasty in answering the question and only saw the word area and then bedroom. As a result the learner calculated the area of the bedroom floor and stopped there. No consideration was given to the mark allocation of 10 marks for this question. In Mathematical Literacy Paper 2, learners should not expect a question of this nature to be broken up into subsections because this is the paper that challenges the learner.

In Qu 4.3.2 learners once again struggled with the division of m^2 with m^2/l and as a result either only divide by 4 or only divide by 5 and then they forget to do the rounding up correctly. This shows a lack of competence in working with the various units and also a lack of understanding of rounding up.

In Qu 4.4 the learners calculated the extra 50% on the normal rate paid but they forget to add that to the standard rate. As a result their final total is incorrect. This is also a problem caused by incorrect interpretation of the language. Learners must learn to read with understanding.

(c) Provide suggestions for improvement in relation to Teaching and Learning
The misinterpretation of the general direction can be rectified in the classroom if the learners are taught how to correctly make use of that compass. General direction also refers to only the cardinal point on the compass. Learners should avoid looking at the position of the compass on the sketch in relation to the position of the bedroom and then answer incorrectly. The position of the points on the compass is the same for all the rooms. The room therefore was therefore facing South.   **In Qu 4.2 learners must be taught to multiply the same units together and to make sure of the conversions. There is a difference in the conversion from cm to m and cm^2 to m^2.**   **In order for learners to be able to accurately answer the sections on space and shape they must be exposed to these sections. Teachers should give learners sufficient practice with conversions so that they are able to apply the different conversions when they have problems to solve.**   **Conversions must include conversion of square units and cubed units, since these are the conversions that learners have the most difficulties with.**   **The suggestions for the improvement of teaching and learning for calculation of areas have been given every year. It is an important section of the work and teachers must ensure that they are also comfortable teaching this section. Make use of as many examples as possible for learners to interact with so that they improve on their skill not only of calculating the areas but also interpreting the sketches given and interpreting which areas have to be calculated.**
(d) Describe any other specific observations relating to responses of learners
The observations noticed in Qu 4.1 in particular are the learners' lack of expertise and skill in determining the general direction.   **In Qu 4.2 learners often forget to ensure that the units are correct. In this case the answer was particularly requested in metres and so many learners failed to convert their answers. As a result they lost marks that were easily obtainable.**   **In Qu 4.3 the calculation of the inside wall area, the most common response was simply to calculate the area of the floor. This clearly indicates a lack of understanding and lack of interpretation. As a result this lack of interpretation led to the loss of a maximum of 10 valuable marks.**   **In Qu 4.4 the main observation was the learners' inability to add the extra time for Saturday to the normal rate in order to receive a new rate for Saturday.**

e)   Any other comments useful to teachers, subject advisors, teacher development etc.
The section that covers space and shape is not sufficiently dealt with in the classrooms. It is important that all teachers are given extra workshops and capacitated with regards to this topic.   It is a topic that is not easily understood and teachers should make use of experts at their neighbouring schools in order to assist them in the sections with which they have problems.   Teachers should also try as far as possible to make use of a variety of scenarios which test all types of questions pertaining to areas, volumes, surface areas etc.   Make use of a wide selection of question papers from the various provinces in order to extend your learners. It is always wise to see how other Provinces or even schools set questions on these topics. Make use of these resources to school not only yourself but also your learners in consolidating their knowledge and application.   Teachers should make use of their subject advisors and insist on guidance from them if they find that they are battling with this section.
QUESTION 5
(a)   General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This question was no doubt the prize question in the paper, the learners generally did well in this question. It was also the question which carried the most weight in the paper, almost 30% of the marks could have been easily gained by the learners in this question.   In most of the centres learners did very well in the question the reason being that it was concepts in data handling which learners have been dealing with since before grade 10 but the questions were not set in a straight forward manner.   Questions were cleverly designed to test learners' abilities to read from tables once again. Information given in the boxes had to be interacted with. Added to this there were also questions where learners had to justify their answers.   The only section in this question which created a problem for the learner was the questions on probability. Learners still continue to write probability in the form of a ratio which was clear from question 5.1.1. In question 5.1.2 learners could calculate the mean and the range correctly but many did not rearrange the data to calculate the median.   Learners struggled with the percentile concept in question 5.1.3 which is a clear indication that this concept is being elucidated by the schools proven by the many learners listing scores below the 75th percentile and leading the question to be fairly attempted.

Question 5.2 was poorly answered due to the inability of learners to calculate percentages and make us of data given on tables. In question 5.2.3 the learners were asked to analyse the results of the two schools, most learners only classified on the basis of pass rate and did not consider the quality of the passes, by referring to the number of degree passes or diploma passes.

This was a good question because if learners go back and look at the question paper, also for those learners entering grade 12, they will now understand what is meant by analysing results and they also now have an understanding of why in a case such as this quality takes preference over quantity.

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

As is mentioned above this question was not answered poorly, the only sections which were poorly answered in some cases were the questions which tested probability and the section where learner had to analyse a set of results and determine which school performed better.

The common error still remains the writing of a probability in the form of a ratio. Even though this has also been mentioned in previous reports as well as in the marking centre the practice still occurs. Teachers must please take cognizance of how a probability can be presented.
In Qu 5.1.2b there was no real problem, learners were able to correctly choose the better performing school but they were challenged when they had to describe their choice. Learners are not sure how to make use of range and mean and also median to clarify or explain their choice.

In 5.2.3 where the learners had to critically analyse the set of results it was clear that the learners did not realize that the quality of the results took preference over the quantity. The common error was also to assume that a smaller number of learners (30) compared to a larger number in another school (153), having a pass percentage of 96,67 will be the better performing school compared to a 87,58% pass rate at the other school. This question also tested the learners' ability to make an informed decision about a set of data given to them.

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

The teaching and learning of the calculation of basic data seems to be satisfactory but we need to make sure that we understand the concept of probability. Make sure that the learners know how to represent a probability and that they are aware that it may not be presented in the form of a ratio.

In terms of explaining your data using mean, median and range, ensure that the learners understand which options are best to choose and when that option is best. For example: In qu 5.1.2b the better performing school is Bathini because of the greater mean and the smaller range. Learners need to be taught how to articulate with these concepts.

Teachers should also try as far as possible to allow learners the opportunity to work with question where they have to make informed decisions from data presented to them.

Make use of sample papers as well as question papers from other Provinces in order to expose the learners to as many types of examples where possible.

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

Most of the learners' responses in this particular question were satisfactory the only concern is still with the presentation of probability as a ratio. It was even concerning to note that teachers at the marking centre also wanted to argue about this. It is evident therefore that learners are not being accurately taught or that teachers who have previously marked and have not learnt from the marking session since this was mentioned last year as well as previous years.

It is also concerning to note that in the sections where learners have to calculate the mean median and range they tend to write down the answers only. Let learners get accustomed with the practice of showing all their working because in some cases the answer is incorrectly rounded off or they forget to arrange the data especially in the case of determining the median of the data and as a result they lose value marks.

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

I am concerned about the teachers' content knowledge with regard to probability. The concept of probability should be made a priority and teachers must be capacitated with regard to this concept.

In most cases it is a new concept for teachers and one that many teachers tend to avoid. I am sure that if they are effectively trained in the concept they will have the confidence to teach it. It is simple marks that learners are now not able to gain because they have either not been taught the concept or they have a misconception about the topic.

Once again teachers should use the subject experts within their districts to assist them. Also make use of your subject advisor and ask for difficult sections to be work shopped.

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

(a) Compliance to NCS, SAG and Examination guidelines:

The Mathematical Literacy Paper 2 of 2011 was of an appropriate standard. The questions were fair for all learners and they adhered to the National Curriculum Statement.

The Subject Assessment Guideline as well as the Examination Guidelines was adhered to. The concepts chosen for the five (5) questions were suitable for all the learners in the Province and while English is still a second language for many of our learners, the language was of an acceptable standard.

This is the paper which has all the difficult levels and the 2011 paper certainly complied with these requirements. Pupils were tested at the appropriate levels and the paper was balanced in that it provided opportunities for all learners who had fully prepared for the examination to provide responses.

(b) 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?

The question paper consisted of 5 questions. All 5 questions consisted of subsections which catered for the all cognitive levels, from low order to high order. In the Mathematical Literacy Paper 2 the questions have to be level 2 – 4. This is the paper where the learners ability to answer level 3 and 4 questions particularly is tested.

The distribution of the cognitive levels is within the national guidelines and provides for the percentages expected in level 4 and 5 questions. The grid provides evidence of the spread of percentage across the levels i.e approximately 20%, 40% and 40% for levels 2 to 4 respectively.

The paper also consisted of five questions which were appropriate and set at the level expected for grade 12. In question five it became evident that learners would have scored most of their marks so perhaps it should have been placed first, since it would have allowed learners to settle themselves and gain confidence for the rest of the paper.

(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?

The question paper was fair. The questions set catered for all the learners both the weaker learner and the stronger learner. Question 5 is the question which carried the most weight in marks (42) and was also the question where learners

could obtain the bulk of their marks. It was cleverly structured with the more routine questions (5.1.2) on mean median and range, concepts which learners should have learnt at GET phase already, allowing the learner the opportunity to gain a maximum of 8 (eight) marks. It also tested the learners knowledge on percentiles (5.1.3) which is a requirement for grade 12, also introduced in the GET phase, sadly though a section which seems to be neglected by teachers. Question 5 was not void of level 4 questions, in total there were approximately 20 marks at level 4 provided for in question 5. This clarifies why I say that the paper was fair because in question 5 alone the learner can score at most 22 marks (52,4%) of the marks set at level 2 & 3.

Question 4 was the question on space and shape it was also a fair question because it is an LO that must be tested and it was set at the required cognitive levels. The mark allocation allowed for learners to score at most 19 marks (67,8%) of the marks set at level 2 & 3. Only 9 marks were set at level 4. The learners however, lost most of their marks at 4.3.1 where they had to work with areas and formulas. This sub section also carried the bulk of the 28 marks in the question, 10 marks.

Question 3 was a practical approach to a question and this also allowed the examiner to test learner's ability to apply knowledge gained in a practical manner. It is slightly concerning though that in the Eastern Cape it was decided to reduce the size of the paper used with the result the scale was not accurate on the question paper written by the learners. This could have resulted in learners panicking because they can see that the scale is not exactly correct but it also places doubt in their minds as to what they should do, work with the fault or accept it and assume what they think the correct scale should be. The question therefore was fair but for the Eastern Cape learner it could be seen as "unfair". This question also tested the learners ability to read and understand the problem set before them and then to use calculations to make informed decisions which is a good way of teaching them a life skill. This question provided the learner the opportunity to obtain at most 14 marks at level 2 & 3 and 10 marks were set at level 3. Once again there is a fair spilt of approximately 50% between levels 2 & 3 and level 4. I will elaborate later on the requests handed in at National level with regard to the difference in the scales on the map.

In Question 2 the learner's ability to read from tables was tested. The learners had to make calculations and confirm calculations done in the tables. Question 2 was a challenging question because it tested accuracy with regards to reading from tables and graphs. Question 2 also tests learners' ability to work with fractions, rate, percentages as well as conversions. As with the other questions only 10 marks (43%) was tested at level 4 which allowed the learner to obtain at most 13 marks at level 2 & 3.

In Question 1 the learner has to demonstrate their abilities to represent a formula on a graph by means of plotting the points from a given equation as well as from an equation they have to form. Once again this is also a section, sketching of graphs, which must be tested. In this question all the learners have the opportunity to obtain 22 marks (73%) at level 2 & 3, but as will be elaborated on later in the report it is the question where the learners lost most of their marks.

In question 1 & question 4 learners could have scored a total of 41 marks (27%) at level 2 & 3. If added to the marks that could have been obtained in question

5 (22) then any learner could have scored a mark of $\frac{63}{150}$, which amounts to 42 percent in only three of the 5 questions.

On the basis of my analysis of the fairness of the paper I would then have to say that the paper was fair, it covered all the LO's and learners were tested on all cognitive levels.

(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?

The question paper consisted of five (5) questions covering all the learning outcomes
(1 – 4), and assessment standards as prescribed in the NCS. The questions are set as per guideline with the necessary percentage for the different levels. The grid provided for the assessment framework clearly indicates that the expected requirements were adhered to.
In the assessment framework it is evident if compared with the question paper and the memorandum that the necessary distribution of taxonomy levels and learning outcomes for Mathematical Literacy Paper 2 does fall within the requirements. The distribution of percentages in the levels was 19% level 2, 41 % level 3 and 40 % level 4.

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

Question 3 is the question which tests the practical application of measurement and the use of scales to calculate distances. In the Eastern Cape the size of the question paper was reduced (275mm X 205mm) and was thus smaller than the standard A4 size, (210mm X 297mm). This resulted in the scale of the ruler and the scale on the map not being standard for all provinces. The Afrikaans paper was printed on standard A4 but the scale on the map was also not accurate. Instead of the scale being 2cm = 300km it was now 1,8cm = 300km.

This matter was presented at the marking guideline discussion in Pretoria and provision was made for the scale in the marking guideline. Alternate solutions were also presented and a consensus was reached regarding the marking guideline.

On arrival at the marking centre the memo was discussed with the Deputy Chief Markers and the Senior Markers. From the discussion it was discovered that while the marking guideline provided for the difference in the scale and the alternative solutions, the discussion at our marking centre led to the discovery that a learner, especially one who does Geography will do the calculation mentally and just write down the answer using the following method:
METHOD OF CALCULATING THE DISTANCE ON A ROAD (WINDING).

Measure the distance between the two towns with a ruler. (Make marks on the ruler directly opposite the two towns, this works easier on the

reverse side of the ruler).

Place the first mark directly opposite 0 on the scale and make a mark opposite 300km on the ruler.

Make use of this new mark and place it opposite 0 on the scale and make another mark at 300km.

Make use of this new mark and place the ruler back on the scale until you get to the last mark made when measuring on the map.

In this particular case the learner will end up with:

(300 + 300 + 50)km = 650km.

The memo allocates 5 marks to the answer and therefore it was felt that some learners could be disadvantaged should they do the mental calculation which would only earn them 1 mark, since there is no provision for full marks for ANSWER ONLY. I also consulted with teachers in our groups as well as teachers who have experience in teaching Geography. These teachers and some of the markers confirmed that learners are indeed taught to use this method and learners would do the calculation mentally.

After consultation with my Chief Marker and the Deputy Markers I compiled a report (a copy of which is attached to this report) and faxed it to the Provincial office on Monday 05 December 2011. The marker training continued for most of Monday 05 December and therefore the scripts where these cases occurred were still in the hands of the senior markers and deputy chief markers. After we received no response to our request for assistance in this regard and to ensure the flow of marking and the flow of mark sheets, we continued to mark as the memo guides us and therefore a learner who showed no evidence of adding the amount together and who simply wrote down the correct answer was only awarded that 1 (ONE) mark. Bearing this in mind I therefore feel that the learners affected here will be unfairly treated should they not be credited for their answer.

I have inserted a copy of the section from the marking guideline below: