Province of the
EASTERN CAPE
EDUCATION

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CHIEF MARKER'S REPORT

INSTRUCTIONS

1. The Chief Markers are required to complete this report during the marking session. The aim of the report is to provide a feed back and to help subject advisors and educators to improve teaching and learning.
2. The report should be informed by discussions between the **Chief Marker, moderator, senior markers and markers** of the particular subject. **NB: There should be one report per subject per paper.**
3. The report must be detailed, informative and indicate question by question performance of the candidates and mark distribution of centres.
4. Reference may be made to the topics identified below as well as any aspect the Examiner wishes to bring to the attention of the subject advisors and educators.
5. **The report must be submitted in hard copy and an electronic version to the centre manager at the marking centre**.
6. All markers reports must be handed in with the hard copy.
7. The electronic report should be emailed to varkchan.joseph@edu.ecprov.gov.za
6. The centre managers then forward the reports to the Directorate of Assessment and Examination (Att: Mr. V A Joseph) in King William's Town.

SUBJECT:	**LIFE SCIENCES**

GRADE:	**12**	**PAPER:**	**1**

DATE OF EXAMINATION:	**20 Nov 2009**	**DURATION:**	**2½ hrs**

1. ANALYSIS OF QUESTION BY QUESTION PERFORMANCE OF THE CANDIDATES

Give a detailed account of how the candidates performed in each question. In doing this, the following steps should be followed:

1.1 The aim/objective for setting the question (what skills, knowledge, values and attitudes were being tested by asking the question)

1.2 Relevance or relation of the question to the Los and Ass.
How did the candidates perform in the question?

1.3 Where did candidates lack expertise or fail in giving an appropriate answer to score high marks in the question?

QUESTION 1

1.1 The objective of this question was to assess the ability of learners to recall facts and knowledge. In doing so, they needed to show their abilities to apply Life Sciences' knowledge and demonstrate an understanding of appropriate terminology applicable in this learning area. It is on that score that you find most of the questions in this question covering LO 2 (application and recall of knowledge) and this makes it a low order question and even in terms of the cognitive level most of these questions in all sub-questions range between A and C except for question 1.6 which was a higher order question that was based on analysis of the investigation that was carried out on flowers. Question 1.4 was slightly a higher order question requiring analysis and simplification of given data and as a result, most of the learners had difficulty in answering it as will later be explained.

1.2 All the LO's and their Assessment Standards were adequately covered in this paper and questions were fair and appropriate for grade 12 learners. There were no unfair questions at all but surprisingly, most of the learners in certain centres performed very poorly. To be more precise, most of the learners in certain centres are still battling with **terminology used in Life Sciences** and as a result they lost a lot of marks in sub-question 1.1 , 1.2 , and 1.3 due to this barrier. Strange enough, some centres have their learners enjoying a free ride in these sub-questions and simply scoop 100% pass. In question 1.1.4 which appeared to be slightly tricky where learners did not consider that Thymine nucleotide pairs with Adenine nucleotide and therefore Thymine and Adenine would be having the same % so that they are able to find out the % of Guanine nucleotide.

1.2.1 There was also a problem with **protein synthesis in 1.4** where learners needed to give an explanation as to what would happen if Guanine is removed in the first base triplet. Most learners could not identify that **the amino acid sequence will change leading to the formation of a different protein.** It is apparent from the responses given by learners that **some** teachers have a problem with this section on protein synthesis and replication of DNA in general. It is also possible that learners are not adequately prepared to answer questions that are based on table with amino acids and base triplets nor are they able to distinguish between Uracil and Thymine. Another problem was in respect of 1.5.2 where **most** learners could not identify **Anaphase II** instead they said it was Metaphase and this made them to lose marks for giving the reason for their answer. The marking guideline was rather confusing and misleading in accepting the use of **chromosomes instead of daughter chromosomes\ chromatids. Teachers are therefore urged to stick to the correct and acceptable terms when describing the events that occur during each of the phases of meiosis or mitosis.** In a nutshell, this area on cell division is also not well managed by teachers in certain centres or possibly, learners do not understand it and are thus unable to make a distinction between mitosis and meiosis.

The same goes with 1.5.4 which was also badly answered, learners could not answer the question which was asking them to state the number of chromosomes present in the cell before meiosis and at the end of meiosis. Generally, learners lacked some basics in the

entire section dealing with cell division especially questions that require analysis and application of knowledge. Learners need to be taught to be careful about their use of terms like 23rd pair of XX chromosomes versus 23 chromosomes. Some do not understand the difference between autosomes and sex chromosomes in a given karyotype. Question 1.6 which was based on an investigation was also badly answered, may due to the fact that learners are not acquainted with investigative types of questions. Most of them were unable to provide ways of improving the investigation instead, they simply wrote the facts supplied in the very investigation which needed to be improved. It is also possible that teachers simply ignore plant reproduction and do not bother to teach it since it is done in the previous grades especially in Nated 550.

QUESTION 2

2.1 All LO's and their assessment standards were adequately covered in this question and its main objective was to test analysis of graph that was showing **menstrual cycle and the influence of the different hormones on it.** Some learners had a problem with question 2.2 , reason being that they just did not have the skill of interpreting a graph and also lacked knowledge about the menstrual cycle. Some did not understand what relationship implies, and as a result, they lost marks on the question requiring them to state the relationship between the level of oestrogen and endometrium from day 7 to 14 in 2.2.5 . All they needed was simply to show the **causal relationship between the two and simply state how the level of oestrogen impacts on the lining of the endometrium guided by the information given in the graphic representation.** Teachers are advised to use different sources when teaching to supplement what ever source they have at school because some textbooks do not show menstrual cycle by means of a graphic representation, instead they simply explain it. Concerning 2.1.6 which was based on vasectomy, learners did not know this kind of procedure, in act the very term was strange to some of them. All questions that were based on this procedure were poorly answered and interestingly, learners did not know how this procedure could serve as a method of contraception. This question needed just common knowledge that vasectomy cannot prevent transmission of HIV by a positive man who has undergone this procedure.

QUESTION 3.

Question 3.1 which was based on blood groups was asked in a very simple way but some learners especially those who understand blood groups and genotypes, found it easy. It is clear again from the responses given by learners that they have very little content in this section. It is also possible that some teachers also have challenges with blood groups given that some had difficulty in marking this question. Some learners had different ways of showing the genotypes of blood groups for individuals W and X and were constantly marked wrong by some markers. Some learners tried to work out the genotypes of the off springs instead of giving what was required. On a slightly different note, the mark allocation in this question was rather confusing, and as a result some learners decided to show the genotypes by means of a Punnett Square. Question 3.1.2 which was based on haemophilia was poorly answered, in fact some learners seemed not to understand what **Haemophilia means.** Teachers are advised to make use of **Exam Guidelines** when tackling the syllabus because the four genetic disorders that learners need to know are outlined in it and how far can teachers go with them.

Question 3.2 on Turner's syndrome was fairly answered by the majority of candidates , let alone the fact that it is not in the exam guidelines something which was also a worrying factor. Most of the information about this disorder was supplied adequately but some learners were unable to answer it. There is also a misconception that the karyotype refers to the sex chromosomes and hence forth learners make the mistake of saying normal female (karyotype) has 23 chromosomes instead of 23 pairs \46 chromosomes. Another problem was in 3.3 yet another investigative question where learners did very badly. Learners did not know ways of improving the investigation supplied. It became apparent from the responses given by learners that teachers hardly give tests or class works based on investigation. Learners are experiencing problems in doing simple calculations. They could not be able to find out the % of boys with unattached earlobes something which did not need any mathematical skill to solve.

There was generally a problem with 3.4 which was based on **genetics both from the side of teachers in the marking of this question and inability of learners to draw a genetic cross.** Most learners performed poorly in this question, in fact their problem was caused by the failure to use the information supplied in the second paragraph to draw a genetic cross. Yes, this question was somewhat tricky in that part of the information on how to answer it was supplied in the first paragraph. Most learners made a cross in P1 between **fur colour and brown fur and thought that this was the correct phenotype instead of black fur x brown fur.** Once again the terms like **heterozygous and homozygous are still a problem to most learners.** In short, there is generally a big problem with **genetics** both from the side of teachers and learners. In fact, there is no way that learners could know something if the very teacher who is supposed to help them has a serious challenge in terms of content gap. This became apparent when markers where marking this question and the mistakes that they committed was evidence enough to convince one that teachers need to be taken through some kind of a workshop on genetics. Question 3.5 was fairly answered by most learners except that some did not understand the meaning of **unplanned pregnancies** and thus they were not given marks for mentioning child support grant, sugar Daddies, poverty, prostitution etc as reasons for falling pregnant because these acts are pre-planned. The marking guideline was very well co-ordinated and the marking of this question was easy in spite of it being an open ended question.

QUESTION 4

Question 4 comprises of an essay which covers mostly LO3 and learners here need to express their views and attitudes on a given controversial topic. The question itself and the essay was fairly answered let alone the fact that second language learners could not express themselves clearly due to the language problem. In question 4.1, most of the learners lost marks because they could not simplify the number of offspring into the ratio. Question 4.1.2 was the easiest form of drawing a Pie Chart and some learners lost marks for wrong proportion but on the whole learners found it easy to answer. Most learners did not give the caption for the pie chart even though the information was given. Regarding 4.1.3, learners had a problem with **roan fur** which was not a familiar colour to them. The concept of **complete dominance was also a problem for some learners, in fact they could not differentiate between complete and incomplete dominance and as a result they were unable to give the explanation for the offspring to have a genotype RW.**

Question 4.2 was an investigation type of a question which was poorly answered by the majority of learners. Many learners did not indicate steps in the planning process instead they gave the method or procedure of conducting an investigation. This again comes back to the point that learners are not equipped with questions on hypothesis testing and steps in the planning process. Learners who were thoroughly prepared in hypothesis testing, did extremely well in this question. The marking guideline was rather confusing in this question because it allowed for method and other steps which are not involved in the planning process. Question 4.2.1 should have asked learners to plan the whole investigation and have everything in the correct order, and this would have been a real assessment of hypothesis testing. Some learners lost marks unnecessarily in 4.2.2 for not indicating the caption of the table even though the information was given in both columns. Some had difficulty in identifying the main fingerprint type or the most common one even though the numbers on the table were reflecting this.

Some learners attempted 4.2.3 but they confused **finger print data base with DNA fingerprinting.** Some learners responded by using one word answer in this question like crime or criminal which does not make sense at the end of the day. Some markers felt that the marking guideline could for this sub-question was too limited. They argue that it could have included things like, you can prove who you are, employers can check to see if you are a good candidate for the job, to identify lost children, lost family members, deceased members, not just when you are dead.

Question 4.3 an essay on advantages of GMO and do they serve as a source of food was a very easy one but most learners struggled a lot with it. This is yet another area that is not well taught at schools. Some learners had a language problem which made them not express themselves clearly in writing this essay even in cases where learners had some facts to present. Most learners did not understand the meaning of ‘explain’ instead they merely listed advantages with no explanation and as a result they lost marks for not answering according to the dictates of the question.

7. ANY ADVICE THAT YOU COULD GIVE TO EDUCATORS TO HELP LEARNERS TO REACH THE EXPECTED LEVELS.

- Teachers must start to prepare grade 12 learners in grade 10 in terms of doing the required scientific investigations.

- Learners must be taught the correct biological terms in the language of teaching and learning in each and every topic eg terminology in genetics, meiosis, replication of DNA, protein synthesis, plant and animal reproduction etc. Learners must be able to link each term with the process being explained eg transcription in relation to protein synthesis.

- Learners need more practice on questions requiring the interpretation of graphs.

- Subject advisors must organise workshops to empower teachers on hypothesis testing- planning an investigation and method of doing it. This should be followed by the formation of subject/L.A. committees for teachers to share best practices.(e.g. a pool of CASS quality activities.)

- Assessment at schools must be on-going, not just an event when activities are needed for CASS purposes. Activities must be given throughout the year and they must consist of a variety of questions ranging from MCQ's , biological terms, data response, to investigations etc.

- Teachers need to be taken through a workshop on blood groups, genetic crosses, cell division especially meiosis.

- There was a bit of an improvement this year on interpretation of graphs by learners and drawing of pie charts. Teachers must continue to reinforce this area by allowing learners to do a variety of questions on other types of graphs and learners must be taught to always give the caption of the graph.

- Workshops organised at the end of the year must be avoided because teachers by this time are busy preparing learners for the end-year exams.

- Learners must be trained on simple calculations, writing of the ratio, changing percentage into degrees. Emphasis should be made on the use of protractors and lead pencil when making graphs or diagrams.

- Teachers must cover the entire syllabus by on or before the end of the third term so that more time could be devoted on revision rather than teaching. This needs a lot of hard work and commitment by teachers. Use could be made of past question papers in this regard to familiarise learners with exam questions.

- Learners must be well informed that they must not write anything about synthesis when writing an essay. **Synthesis means impression marks.** This can be done by training learners to understand the meaning of a rubric for the marking of an essay even if it means attaching it in the question paper.

8. ANY OTHER COMMENTS

The impression that markers have about this 2009 LFSC question paper is that it was a very good paper with interesting questions which covered all the LO's and their assessment standards. Questions were formulated in a simple a language which catered for rural learners who use English as a second language. All questions were clearly phrased with no ambiguities. It is however disappointing to note that most of the learners in our Province are in the range of level 1-4. This suggests that there is still a lot to be done in schools under MIP. In fact, Matric is not the grade where intervention needs to be done, focus must be on the lower grades and all assessment activities must be moderated by HOD's and Master teachers to ensure quality question papers.

SIGNATURE OF EXAMINER/MODERATOR: _____