



NSC 2011 CHIEF MARKER'S REPORT

SUBJECT	Life sciences		
PAPER	Paper 1 : version 2		
DATE OF EXAMINATION:	NOVEMBER 2011	DURATION:	2hrs 30mins

SECTION 1:

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

- The format of the paper is the same as last year, with regard to section A,B, and C together with the allocation of marks, meaning the paper was in no way a stranger to the students. Most of the questions covered were based on the previous year's question papers such that students who spent time revising the question papers benefited a lot. Most alarmingly, from the scripts I've moderated the performance of the learners reflects just the opposite suggesting that the students who wrote version two are part time students, is a problem in terms of commitment to studies. I would imagine that some of them are working or doing part time jobs and they just go to an exam without making a single preparation like studying with the hope that they know the topics and they are the same as when they were full time students. It is against this background that I propose something be done to help these learners or make them to register full time whilst following the old content to avoid fruitless expenditure of tax payer's money. The performance of the learners ranges between level 1 and 6 with most of the learners obtaining level one and a few level 4. Question 1 was fairly understood by majority of the learners because it comprised mainly of lower order questions like multiple choice questions, terminology, matching type and a few essay type questions. Most students still struggle with the terminology in 1.2 and 1.3 and as a result they lost marks unnecessarily. In 1.4 some students did not understand the phases of meiosis that were given and as a result they failed to identify the sequence of events in meiosis. Some do not even know the significance of meiosis which was out of four marks for two points.

- **Question 2 was generally poorly answered by the majority of the candidates and very few of the children obtained above 15 out of 30 marks. Once again, candidates struggled a lot in differentiating between early interphase and prophase of mitosis and early prophase of meiosis 1 and late prophase of meiosis 2 resulting in them losing more marks. The question on hypothesis testing was also a problem. The same goes with question 3 which was also poorly answered. Most of the learners still struggle with genetics and drawing of the monohybrid cross. The question based on the pedigree was also a problem, though it was asked in a very simple way. In question 4 learners could not account for reasons why people are in favour of genetic engineering in plants as well as reasons that people might have against cloning of humans. Most students managed to get a fair amount of marks from the graph and the mini essay.**

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?

QUESTION 1 OUT OF 50

This question was answered fairly well by most students but subject terminology is still a problem; especially 1.2 and 1.3. Some learners do not understand simple things like the significance of meiosis and others have very little understanding of the karyotype of a human being as well as differences between autosomes and sex chromosomes.

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

Lack of understanding of relevant terminology needed in 1.1, 1.2 and 1.3
 Inability to identify phases of meiosis and the sequence of events that occur during meiosis.
 Question 1.5 was based on a table showing autosomes and sex chromosomes of the human egg and sperm cells. Alarmingly most students could not exploit this by simply adding the number of chromosomes found in the egg cell and those of the sperm cell in order to get the total number of chromosomes of the zygote formed after fertilization.

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

Teachers must spend time explaining the terminology even if it means writing them on the chalkboard for learners to see how they are spelt and written. Teachers must use the terms during lesson presentation instead of explaining them as loose entities which have nothing to do with the topic at hand. The format of controlled tests must be the same as that of the national exams to make learners familiar with the use of terms used in life sciences. It would also be appreciated if teachers could use the previous question papers as exemplars when setting their own papers. Teachers must also assess learners a lot by giving a variety of questions taken from the previous question papers and discuss the findings with learners for each sub question to avoid a situation where learners will commit the same mistakes even in the next assessment.

(d) Describe any other specific observations relating to responses of learners
Learners do not read the instructions given on how to answer each sub-question. Learners do not prepare themselves adequately for the writing of exams. The problem with the part-time students is that they think they can remember what was taught in class when they were full time without making any effort in studying and revising
(e) Any other comments useful to teachers, subject advisors, teacher development etc.
Subject advisors must be visible in schools to give a genuine on site support to teachers experiencing problems with terms used in life sciences. Teachers teaching grade 10,11, and 12 must come together and decide on the text book to be purchased by the school for use by these grades. The choice of the textbook must be informed by its usefulness in terms of covering the content and terms used in life sciences rather than to please book publishers.
QUESTION 2
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
This is one of the most poorly answered questions in spite of it being taken from the previous question papers. Students who spent some time revising the previous question papers benefited a lot and scooped a lot of marks in this question. The majority of learners do not know the phases of mitosis and meiosis respectively and are thus unable to link the sequence of events with the given diagrams. Question 2.2 was based on the graph showing results of an investigation into the frequency of blood groups in a small population. The strange thing is that learners could not capitalise on the fact that the information is in the graph, and all they needed to do was simply to answer according to the data given in the bar graph. Most of the students got some marks in 2.3 which had a diagram showing DNA in a process of transcribing m RNA. The majority of students simply write RNA instead of m RNA and as a result they lose marks for the identification of the structure labelled B but on the whole, this sub-question was answered fairly well by most students. Sub-question 2.4 was based on hypothesis testing and this is where most of the students failed to answer according to the instructions given in the question paper. It does appear that most of the learners do not know a thing about investigation type of questions, let alone the understanding of variables that come into play in hypothesis testing and the relationship between them.
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
The first general problem was that of not being familiar with the phases of mitosis and meiosis respectively. The second one was the problem relating to the graph and lack of understanding of blood groups. The other problem relates to the lack of understanding of steps involved in hypothesis testing and ways by which it can be improved. Most learners cannot state the hypothesis and include both the dependent and the independent variables.

<p>(c) Provide suggestions for improvement in relation to Teaching and Learning</p>
<p>It is rather difficult to suggest some improvements to teaching and learning because these students are part time and are no longer in the class. However, the following strategies could be tried, one of which must be to look after these students by organizing some classes for them after school and organize tutors for them. The second thing should be to encourage tutors to make use of exemplars as a guide when assessing these learners to train them on the format of the national question papers. More time must be spent on investigative type of questions and hypothesis testing to train students on the steps involved in an investigation. The other area that needs serious intervention by subject advisors is the one dealing with genetics, seemingly some teachers are also experiencing some difficulties in the teaching of this area and hence I am proposing that some workshops be organized for tutors of these part time candidates so that they can overcome this barrier.</p>
<p>(d) Describe any other specific observations relating to responses of learners</p>
<p>In sub question 2.1 learners just write whatever comes first in their minds for as long as it is about cell division and do not bother to read the table supplied with relative amounts of DNA which were measured in the cells of plants during mitosis and meiosis. Learners also appear not to understand the different phases of either mitosis or meiosis and this can be attributed to poor teaching of this area when they were full time. Concerning 2.2 dealing with blood groups, most learners do not have an understanding of this area and as a result they end up giving irrelevant answers to the questions asked. With regard to 2.3, most of the learners managed to identify transcription as a process shown by the given diagram but some were just to casual in simply writing m RNA as simply RNA and in the process they lost marks because there are basically three types of RNA which operate in different areas of the cell. Question 2.4 was badly answered by the majority of learners because it was dealing with hypothesis testing which is an area that is not well understood even by the teachers. Learners do not know how to state a hypothesis and show the cause and effect between the two variables given in the opening statement. It was also disturbing to note that learners do not know which variable is dependant and which one is independent.</p>
<p>(e) Any other comments useful to teachers, subject advisors, teacher development etc.</p>
<p>Teachers who experience content gaps in the areas that cause learners to fail must enrol with institutions of higher learning to empower themselves in these areas. Quality teaching can never be attained if teachers themselves have content gaps in certain areas of the syllabi. Subject advisors must visit MIP schools more frequently and organise workshops to empower teachers in the areas where they experience challenges. Some specimens showing cell division must be sought so as to enable learners to see clearly how mitosis and meiosis occur in both plants and animals. Schools that have electricity must organise CDs with sketches of diagrams showing genetics and cell division and this helps to enhance effective teaching and learning.</p>

QUESTION 3
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
Question 3 was also poorly answered by most candidates. The first part of this question sub section 3.1 was based on genetic cross which candidates had to draw for six marks. Mind you that the information needed to draw the cross was provided in the form of a table with all the genotypes of the four rabbits and the phenotype was also stated. The poor response by candidates in this question can therefore not be justified. Question 3.2 was based on the diagram of a developing foetus attached to the mother's body through the placenta. Some candidates struggled to give harmful substances that may pass from the mother to the foetus whilst some do not even have an idea of what harmful substances are. It was also shocking to find that some candidates do not know the reasons why some people might be against the use of amniocentesis. Sub question 3.3 was based on the pedigree diagram and asked in a very simple form. Most of the candidates managed to get the whole six marks for stating the genotypes of the individuals mentioned. It was also disturbing to note that some candidates cannot even write the sex chromosomes.
(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
It was due to the fact that learners did not prepare themselves for the examination instead they simply relied on the information they gained whilst they were at school as full time students. The candidates do not know the difference between phenotype and genotype and they cannot do basic calculations of ratio as asked in question 3.1.1. Candidates did not know the process of amniocentesis and they did not know the value of this process. Candidates have difficulty interpreting pedigree diagrams because they were not taught to do that.
(c) Provide suggestions for improvement in relation to Teaching and Learning
The relation would improve if candidates are supplied with exemplars. Tutor candidates for future examinations.
(d) Describe any other specific observations relating to responses of learners
The candidates do not know the content of the syllabus and cannot apply their knowledge to the questions.
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

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

This question was answered fairly well and the average mark for the 100 script sample was 15.8 out of 40. Question 4.1 Cloning: This whole question caused problems mainly due to the fact that the candidates did not know the process of cloning or had forgotten it from the previous years. Question 4.1 Candidates just copied the labels from the diagram when asked why it was necessary to remove the nucleus from the egg cell of the second donor. Question 4.1.2 They knew that Dolly would have the characteristics of the first donor, but could not explain their answer when asked to do so in question 4.1.3. Question 4.1.4 Many candidates did not know the meaning of the word “cultured” and wrote about cultural values with regard to cloning. Question 4.1.5 This part of the question on why people could be in favour or against cloning was answered well by the candidates as it was simple recall. Question 4.2.1 In this question candidates had to draw a graph of the information in the table, this question was answered well and most of the candidates got high marks and the fact that the data was given in the form of a table, counted in their favour. Question 4.2.2 The candidates however struggled to express themselves when they were asked to draw a conclusion from the results in the table. Question 4.3 Essay-Gonorrhoea and HIV/AIDS – Candidates misunderstood this question and did not develop headings or sub-sections and just wrote a continuous essay where markers had to look for marks. They confused the causes of AIDS and Gonorrhoea which are respectively a virus and bacteria, they wrote answers of not using a condom and abstaining as causes for the disease. Once again this was a language problem where candidates did not completely understand the question, however the majority of learners did well in 4.3 except that the work was without sub headings in certain instances to enable them to have a flowing argument. Learners could have scored full marks in this question in question 4.3 if they had followed the guidelines given in the mini essay

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

Candidates did not know the process of cloning and misunderstood the essay question and were not able to plan and answer the question properly. Some learners seem not to know a thing about genetic engineering , thus they were unable to answer question 4.1.5 which required them to give reasons why certain people might be in favor of genetic engineering in plants.

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

Part-time candidates must be given some form of tuition even if it is after school to expose them to a real teaching and learning environment. The section dealing with biotechnology must be taught with the help of cds where this is reasonably possible. Train the candidates to write essays. Candidates must be supplied with exemplars to familiarize them with the types of questions asked in the papers. Try to supply these candidates with text books.

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

These candidates were not prepared for the examinations. We wonder whether they even had textbooks. Poor understanding and comprehension with regard to question 4.1 about cloning. Lack of skill in the writing of an essay

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

Teachers who experience content gaps in the areas that cause learners to fail must enrol with institutions of higher learning to empower themselves in these areas. Quality teaching can never be attained if teachers themselves have content gaps in certain areas of the syllabi. Subject advisors must visit MIP schools more frequently and organise workshops to empower teachers in the areas where they experience challenges. Some specimens showing cell division must be sought so as to enable learners to see clearly how mitosis and meiosis occur in both plants and animals. Schools that have electricity must organise CDs with sketches of diagrams showing genetics and cell division and this helps to enhance effective teaching and learning.

SIGNATURE OF CHIEF MARKER: _____



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