

Nutrition

2013 Chief Assessor's Report



Government
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NUTRITION

2013 CHIEF ASSESSOR'S REPORT

OVERVIEW

Chief Assessor's reports give an overview of how students performed in the school and external assessments in relation to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outline. They provide information and advice regarding the assessment types, the application of the performance standards in school and external assessments, the quality of student performance, and any relevant statistical information.

This is the third year in which Nutrition has been assessed within the SACE Science Learning Area. The enrolment numbers were similar to those of 2012, as was the standard of student work, with approximately 20% in the A band, 37% in the B band, and 35% in the C band.

SCHOOL ASSESSMENT

General Comments

Schools provided for moderation sets of evidence of the two school assessment types. Most teachers used the Variations — Moderation Materials form to indicate when student work was missing, and student work in general was clearly labelled. Teachers are encouraged to check the accuracy of grades when they are transferred from student work to results sheets, as occasionally there appeared to be some errors in this process.

It was helpful to the moderation process when teachers provided a summary or cover sheet for each student. It was occasionally difficult to confirm a teacher's decision when there was no indication as to how a grade level had been assigned — for example, when no teacher feedback was provided on the student work, or no assessment rubric was included. Although interpretation of the performance standards overall was good, some teachers tended to be very generous in assigning grade levels, particularly in relation to the analysis and evaluation and investigation assessment design criteria. Moderators noted that, although most teachers used current performance standards, a significant minority did not, and this sometimes affected student achievement against current performance standards. Teachers should ensure that they are using a current subject outline and assessing according to the current performance standards.

Moderators noted that most assessment tasks, particularly for Assessment Type 1, were based on support materials available on the Nutrition minisite. Whether teachers design their own tasks or modify available materials, it is important to ensure that tasks give students opportunities to demonstrate achievement at the highest levels of the performance standards. Evidence for the assessment design criteria and specific features identified for a task on the learning and assessment plan should be demonstrated in the actual task. For example, if I1, 'Design of nutrition investigations', is chosen, a design aspect must be evident in the task.

In some classes, taught by different teachers and combined into one assessment group, students with different standards of work had been awarded the same grade level. This means that the moderators often need to make adjustments to grades. To avoid potentially disadvantaging some students, it is suggested that teachers in this situation share assessment tasks and engage in internal moderation to ensure consistency of marking standards. Finally, teachers are reminded that an A+ should be given only when a student consistently demonstrates sustained achievement at the upper level of the A band.

Assessment Type 1: Investigations Folio

Most teachers provided a suitable range of tasks to allow students to demonstrate their skills and abilities to suit their learning style. This was supported in the cohort/context descriptions, learning program designs, and capabilities, literacy, and numeracy opportunities of the learning and assessment plans.

Practical Investigations

An improvement in task design was noted this year. Students who were most successful benefited from clear, explicit instructions and tasks that gave them opportunities to demonstrate performance at A levels. It was pleasing to see more evidence provided for the assessment of specific feature A3, individual and collaborative work skills, in the form of either checklists or self/peer/teacher reviews, and sound feedback to students from teachers. Similar evidence needs to be provided for the assessment of specific feature I3, manipulation of apparatus.

Some design practical investigations did not allow or enable students to demonstrate their design skills and analysis and evaluation at the higher grade band. High-standard reports included a concise hypothesis, evidence of how the student formulated the design, explanations in terms of relevant scientific concepts, and scope for a comprehensive analysis of data and procedures. Students should have time to experiment with their design before it is assessed against specific feature I1, designing investigations. The design should be submitted for assessment before the student actually carries out the investigation; feedback from the teacher can then be used to modify the procedure if a design is unlikely to yield results that can be adequately analysed. In this instance the original grade for I1 remains but the student is less likely to be doubly penalised for a poor design. Students are more likely to be able to discuss results successfully when they investigate only one independent variable.

An area of concern continued to be insufficient evidence to warrant grades awarded for design skills, presentation of findings from investigations, and analysis and evaluation of data. Students who have formative experience in designing safe and appropriate investigations will have a better understanding of the requirements of the design task. Food preparation tasks that involved changes to dietary needs and links to sensory evaluation potentially allow for a high level of analysis and so can be structured as a design task.

Analysis of sources of errors continues to be problematic. A lack of knowledge about types of errors (random and systematic), and their relationship to precision and accuracy, was a common issue. Although many students included a discussion of errors, it tended to be quite general, rather than explicitly referring to the actual procedure in the practical undertaken. Students should consider the source of potential errors, and include details of how to reduce or avoid these, particularly in their design practical. A critical analysis by perceptive students should include

explanations of how errors and improvements affect the results, and hence the conclusions.

Although students should be encouraged to write in a precise and concise manner in reports, teachers should consider not imposing word counts for practical investigations as they are not required and can be limiting for the more able students. In some investigations, multiple connections, conclusions, solutions, and predictions can be made and thus allow for more evidence of higher-order analysis and evaluation to be presented.

Issues Investigation

It is important to ensure that the issues investigation does, in fact, investigate a nutritional *issue*. Teachers are encouraged to provide appropriate guidance in the early stages of this task to ensure that students refine a broad, general idea into a specific, focused guiding question. When broad questions are posed, it is difficult to discuss alternative viewpoints in depth within the word limit. The issues investigation provides an ideal opportunity to assess the selection and acknowledgment of information. Students are expected to use a range of sources, which should be referred to in the text and referenced correctly in a reference list. An evaluation of the information found in these sources, for bias, credibility, accuracy, and suitability, should be included with the report and within the 1500-word limit.

Different assessment conditions were used by teachers for the issues investigation. A timed, in-class task for students was popular, with a limited number of articles, provided by the teacher and/or sourced by the student, used as the basis for completing the task under supervision. Other students were given an extended time in which to investigate an area of interest and then write a report in their own time. Students who submitted highlighted or annotated articles with their task provided evidence of their ability to select suitable information.

Assessment Type 2: Skills and Applications Tasks

The skills and applications tasks consisted mainly of tests and trial examinations, drawn mostly from past examination questions and study guides. Sometimes the choice of questions limited students' opportunity to demonstrate higher-order thinking in analysis and evaluation, and application. Open-ended questions that ask students to analyse, evaluate, and apply information, or to explain and justify connections, provide greater opportunity for students to achieve at the higher levels of the performance standards. In particular, the use of extended-response questions will allow students to critically apply, analyse, evaluate, and synthesise at the highest level. Teachers are also encouraged to use a variety of forms of assessment that give students different opportunities to demonstrate their knowledge and understanding, and should refer to the examples on the Nutrition minisite.

Most skills and applications tasks were assessed using marks. Care needs to be taken when constructing these tasks to ensure that the questions address the specific features indicated in the approved learning and assessment plan, and that there is a range of levels of difficulty within the questions for each specific feature. This helps to align marks with the grades indicating the levels reached by students.

Some marking tended to be overgenerous as students were given full marks for generic and/or poorly worded responses or badly constructed charts and graphs, and had limited opportunities to undertake extended responses.

EXTERNAL ASSESSMENT

Assessment Type 3: Examination

General Comments

As in past years, the examination was in two parts: short-answer questions (based on the four core topics) worth 100 marks and extended-response questions worth 20 marks (for which students answer one question on the option topic they have studied during the year). This was the second year in which three question booklets were used (Question Booklets 1 and 2 contained the short-answer questions and Question Booklet 3 the extended-response questions). It was pleasing to note that no students used the extended-response booklet to record responses to the short-answer questions. Students are, however, reminded that any answers written on the extra answer page at the end of a booklet must be clearly identified and in the appropriate booklet.

Students are reminded to write legibly, and to ensure that any corrections can be clearly identified. Students should also use their reading time wisely, carefully reading the question and interpreting what is required. Students should be able to use specific terms found in the subject outline in the context of their written responses. Examinations also make use of visual information (e.g. graphs, tables, diagrams) and students should be able to interpret and manipulate data presented in such formats, and then use the data in their responses. These are skills that can be improved by practising questions from past examination papers.

Students are also reminded that paraphrasing the wording of the question in their answer is not required and will not be awarded marks. The correct use of terminology and conventions was a weakness in both parts of the examination, as was poor written expression. The quality of students' extended responses in particular would benefit if they had frequent opportunities during the year to respond to examination-style questions that focus more on higher-order skills such as analysis and evaluation, and application, and less on knowledge and understanding.

Part 1: Short-answer and Analytical Questions

The short-answer section can contain eight to ten questions. Questions that are worth 4 marks usually require students to provide two relevant and well-expressed pieces of information. Those questions where 3 marks are allocated usually require students to name or state a fact and then follow with descriptive or explanatory detail.

Questions varied in level of difficulty, from those that required straightforward factual information, through to those that required the skills of critical understanding, application, problem solving, or evaluation of nutritional information. Students need to be mindful to use all information provided in question stems and subsequent parts of the question when formulating their response.

In general, students who wrote clear and concise answers that related to the question stem or scenario performed well. The number of marks and the space allocated for responses indicate the expected depth and length of an appropriate response. Some responses were far too brief for the marks allocated. For example, a 'describe' or 'explain' question requires more than a one-word or two-word answer. Other responses were much too wordy for the marks allocated and, although there is no penalty for longer responses, they do reduce the time available to respond to

other questions and often do not improve the clarity or relevance of the response. Students can learn how to respond to the various process words in questions by practising questions from past examination papers.

Question 1

- (a) Most students correctly identified vitamin B₁₂ as water-soluble.
- (b) Many students left this part of the question unanswered. Those who responded commonly identified the role of vitamin B₁₂ in red blood cell formation. Few identified its roles as a coenzyme in protein metabolism, a co-factor in carbohydrate metabolism, or in maintenance of the nervous system, where it helps to maintain the sheath around nerve cells.
- (c) Many students appeared not to understand the term 'food group', and instead gave examples of specific foods. The most common correctly named food group was dairy or, rarely, the milk, yoghurt, cheese group. A small number of students identified the 'meat and alternatives' group although some stated 'lean meats and poultry, fish, eggs'.
- (d)
 - (i) Most students identified fatigue, lethargy, and loss of concentration as common symptoms. The better responses also identified anaemia, and described the corresponding symptoms, but very few students named the correct form of anaemia (pernicious anaemia).
 - (ii) Many students were able to partly answer this part of the question. They identified that people with coeliac disease are at risk of vitamin B₁₂ deficiency, but related the risk to the elimination of gluten-containing foods, which they incorrectly described as being high in vitamin B₁₂. Although they understood the cause of coeliac disease they did not connect the loss of villi or diarrhoea (both features of coeliac disease) to problems with vitamin B₁₂ absorption in the small intestine.
 - (iii) Most students attempted this part of the question and were able to state the name of a relevant group. The most common correct answers, which were well justified, included vegans and vegetarians; this was not the case for other groups identified by students. The less common correct answers included the elderly, because of physiological factors (people produce less stomach acid as they age) and socio-economic factors (may be unable to shop or cook or can't afford high biological factor protein sources), and those in developing communities, because of increased levels of poverty. Disappointingly, few other groups at risk were identified, for example, people lacking intrinsic factor, people with atrophic gastritis, alcoholics, or those with other autoimmune diseases such as Graves' disease or systemic lupus.

Question 2

- (a) Many students simply reworded this part of the question as an answer in itself (e.g. 'nutrient-dense high in nutrients'), rather than describing nutrient-dense foods as being rich in nutrients relative to their energy content and energy-dense foods as being high in kilojoules and lacking in a variety of nutrients. It was also common to see energy-dense foods described as having 'empty kilojoules'.

- (b) Most students scored 1 mark for this part of the question. They identified the importance of establishing healthy eating habits early so that they would persist into adulthood, but neglected to make the comparison with high-school students, who tend to be less cooperative and compliant than primary-school students.
- (c) (i) (1) This part of the question was generally done well. The most common errors included not rounding the final answer as required, inaccuracies when adding up numbers, and multiplying by the incorrect kJ/g value for relevant macronutrients. Students are encouraged to show their working, as marks can be awarded for process even if the final answer is incorrect.
- (2) This part was done well, with almost all students gaining full marks.
- (ii) Students who gained full marks for this part of the question incorporated the data in their comparisons.
- (d) (i) Almost all students identified a suitable replacement snack.
- (ii) Most students secured at least 1 mark for this part as they were able to identify a nutritional benefit of the replacement snack. Those who explained why the replacement snack was nutritionally superior gained full marks.

Question 3

- (a) (i) Most students scored at least 2 marks for this part of the question, and most answers indicated that the diet followed by vegans is well understood. Most identified seasonal vegetables or legumes as a suitable substitution for mince, to make the recipe acceptable to vegans. Many students recognised that either of these substitutions would provide complementary protein or non-haem iron. Other suitable alternatives included soy-based milk, almond milk, or coconut milk, or vegan cheese substitutes.
- (ii) Most students identified the relationship between their suggested substitution and cardiovascular disease by mentioning the increased saturated fat content. However, they often did not connect increased saturated fat intake with increased plaque build-up. Some students who suggested seasonal vegetables explained how an increase in soluble fibre reduced cholesterol levels, which benefits those with cardiovascular disease.
- (iii) (1) Most students gave two appropriate substitutions, for which they and (2) received full marks.
- (b) This part of the question was done well overall. The most common suggestion was to replace deep-frying with baking or grilling to reduce the saturated fat intake, or the total fat intake. A few students also suggested removing salt, which contributes to hypertension — a known risk factor for cardiovascular disease.
- (c) (i) Most students identified the danger zone (and gave the correct temperature range) that would make the room temperature ideal for the growth of bacteria that cause food poisoning. The uncovered lasagne was also identified as a potential contributor to food poisoning as airborne pathogens could contaminate it. It was pleasing to see an awareness of how rapidly bacteria can multiply in

such conditions, and answers overall revealed a sound understanding of food safety and storage procedures.

- (ii) Most students suggested suitable storage conditions but did not identify how they would reduce bacterial growth. Many students seemed not to understand that bacterial growth is slowed down at temperatures below 5°C.
- (iii) (1) This part was answered well. Most students identified a suitable method for reheating the lasagne.
- (2) The quality of student explanations varied. For example, the better responses noted that a microwave is a quick method of reheating, thus reducing the time the lasagne is in the 'danger zone' (5°C to 60°C), and that it helps to reduce nutrient losses. A few students recognised that it is important to reheat food to above 60°C all the way through.

Question 4

- (a) Although a few students appeared not to understand the difference between physical and structural, most answered this part of the question correctly. Most students correctly described the physical difference at room temperature but a small number of students demonstrated significant depth of knowledge of the structural differences.
- (b) Most responses indicated that students understood that essential fatty acids are required for biological processes but must be obtained from food as they are not synthesised in the human body.
- (c) (i) Almost all students correctly chose salmon.
- (ii) This part was more problematic. Many students chose sunflower oil or almonds, and a small number incorrectly chose salmon.
- (d) (i) and (ii) A small number of students did not attempt these parts of the question. Many students gave correct and detailed information about the functions of omega-3, commonly relating its role in plaque deposition on the inner walls of blood vessels, brain growth and function, or joint inflammation. The functions of omega-6 were generally less well understood. The most common responses related its role in the regulation of blood pressure, nerve transmission, or blood clotting.

Question 5

- (a) (i) Although many students were able to correctly identified BMR and daily activity values, a number appeared to have difficulty calculating the thermic effect of food.
- (ii) Few students had difficulty completing this calculation.
- (iii) Most students correctly indicated that Samuel would continue to gain weight.
- (b) (i) Few students achieved full marks for this part of the question as they misinterpreted it and discussed only the negative aspects of the fad diet.

Those who scored highly focused on the positive aspects of the AGHE that made it superior for weight loss.

- (ii) This part of the question was generally answered well, with most students able to identify that weight loss would occur if exercise were increased.
- (iii) (1) Most students suggested appropriate lifestyle changes. A small number and (2) suggested changes that were dietary, indicating some confusion about the difference between lifestyle and dietary changes.
- (c) (i) (1) Some students gave superficial or irrelevant answers to this part of the question. High-quality responses identified either a decrease in the volume of food intake (thus limiting the likelihood of achieving RDI for micronutrients) and/or a reduction in absorption as a result of the removal of most of the stomach and small intestine (both involved in absorption).
- (2) Most students were able to name scurvy and pellagra. A few also named xerophthalmia.
- (ii) Many students gave general or vague descriptions of macronutrient digestion and its breakdown products, rather than focusing on chemical digestion in the duodenum. Most students scored 2 or 3 marks out of 6. A large number of students could not name a single enzyme or state its role in macronutrient digestion.
- (iii) Most students were able to identify a social or psychological consequence of gastric bypass surgery.

Question 6

- (a) A large number of students linked this idea to food safety, with only a small number making the link specifically to food poisoning.
- (b) Many students struggled to answer this part of the question, with most simply paraphrasing the question stem without adding more detail to it. The responses were rarely linked to food or the cafe mentioned in the scenario.
- (c) (i) and (ii) Most students appeared to misinterpret this part of the question, and few students were awarded a mark for their answer about the hazard. Responses tended to be vague, and only a small number of students identified an ingredient or food that was a potential hazard at a particular stage. However, food safety practice responses were better, with storage temperatures and cooking methods the most popular (and obvious) targets. The few students who gained high scores for this part of the question identified a food, described how it could be a hazard, and gave detailed suggestions about how to avoid or prevent problems.

Question 7

- (a) This part of the question was generally answered well. Most students identified relevant physical characteristics that could differ between fresh pizza and reheated frozen pizza. The most common correct responses related to texture or cellular damage to ingredients, such as pineapple, in reheated frozen pizza. A small number of students stated sensory characteristics, such as appearance.
- (b) (i) and (ii) Most students achieved full marks for this part of the question, indicating a sound understanding of experimental design.
- (c) (i) Although most students suggested decreasing or eliminating salt, they failed

to explain the link between salt and hypertension and did not achieve full marks.

- (ii) Most students achieved high marks for this part of the question. Students are, however, reminded that rulers should be used to connect points on a graph.

Question 8

- (a) Once again a number of students simply paraphrased the question, with very few able to talk about micronutrients in food being in a readily absorbable form, with little risk of toxicity and in useful proportions. A small number focused on the cost of food as being less expensive than supplementation.
- (b) (i) and (ii) Most students identified two micronutrients but struggled to explain why they are of benefit to elderly people. Calcium, iron, vitamin C, and vitamin D were among the most popular responses.

Part 2: Extended-response Questions on Option Topics

The extended-response part consists of two questions. Students are expected to answer the question on the option topic that they have studied. There are four main dot points that students should address sequentially, each of which is worth 4 marks. Students give two relevant and well-expressed pieces of information for each dot point. The 4 communication marks are awarded for clarity of expression, use of nutrition terminology, organisation of information, and relevance to the question.

Virtually all students offered a response to the appropriate extended-response question. A small number of students attempted both questions, which is wasteful of time. Most students attempted a response of appropriate length and organisation, but the use of nutrition terminology was poor and responses did not always relate to the question. Teachers should dissuade students from writing (sometimes lengthy) introductions and conclusions, which do not attract any marks.

Many responses were far too general and did not show a solid depth of understanding of the topic. More detail is expected in this part and simply paraphrasing a dot point will attract no marks. It was common for students to address only part of a dot point. For example, some could explain a weather event and its impact on crops, but then failed to link that to the ecological sustainability of food production. Many students did not focus on the key terms (e.g. sustainability and secure food supply) in their answers.

Higher-achieving students were distinguished by their ability to use appropriate nutrition terminology correctly, and to logically and coherently link information or explain connections in detail.

Question 9: Global Nutrition and Ecological Sustainability

Dot Point 1

Students were able to identify examples of extreme weather events (flood and drought being the most common) as well as give a general outline of the type of short-term impact such events have on the land. Most students were unable to give specific examples of an impact, exposing their lack of knowledge of agricultural techniques and land use. Few students linked the impact of weather events to ecological sustainability of food production.

Dot Point 2

This was the most competently answered dot point. Although some students did not demonstrate a thorough understanding of genetically modified organisms (GMOs), and how they could help in food production, many others were able to do so. Good responses mentioned that GMOs can be used to improve yield, pesticide resistance, and drought resistance. Those who scored full marks also provided a specific example and described how it would help to secure a sustainable food supply for communities.

Dot Point 3

Most students appeared to misunderstand the intention of this dot point, and discussed food preservation techniques that would prevent food spoilage (e.g. canning or vacuum packaging) and increase the shelf life of products. The small number of students who did discuss sustainable packaging did not provide much specific detail and gave generic responses about recyclable or biodegradable materials.

Dot Point 4

Most students addressed this dot point poorly. Strategies tended to be vague, and few students went on to describe how they could contribute to a sustainable and secure food supply. Answers relating to processing and manufacturing mostly suggested giving 'funding' but did not give specific examples of how these funds could be used. Few responses discussed, for example, current government programs that are directly involved in finding solutions to this issue. There was a general lack of knowledge of how governments can help with sustainable and secure food production.

Question 10: Global Hunger

Dot Point 1

Many students found this dot point challenging. Although few students explored the concept of a food supply chain, many discussed how wastage occurs in either First World countries (e.g. throwing away excess food or sellers rejecting physically imperfect produce) or Third World countries (e.g. storage problems that lead to food spoilage, poor harvesting techniques, road or water infrastructure). Although it was unnecessary to do so, some students tried to describe solutions to 'share' food more equitably between nations, having missed the point that all that was required was to identify sources of food wastage and discuss how food wastage could contribute to food shortages.

Dot Point 2

Although most students were able to identify and describe protein-energy malnutrition disorders, it was disappointing to see some students referring to a micronutrient disorder such as rickets or scurvy, or the most common incorrect response, iron deficiency anaemia. Students who identified marasmus or kwashiorkor were able to describe symptoms in adequate detail, although some confused the relevant symptoms of these two disorders. Most students were then able to relate information about the impact on the community being a depleted workforce, leading to a reduction in food production. Some also discussed the impact of children not being able to attend school or the pressure on parents to look after their children, as well as pay for medical bills.

Dot Point 3

This dot point was generally answered quite well, with many students able to link poverty and lack of money to inability to buy food. Most students stated that a low economic status would mean that food was not able to be purchased, while the better students then also linked the inability to buy seeds or farming equipment, or to access clean water. They also made links to poor education being a barrier. Some students misinterpreted the question and discussed the country/government, making little connection with communities or individuals. Few students discussed the idea that low economic status disadvantaged communities in terms of competitiveness in the marketplace, as they would be unable to afford food for their community, or led to a power imbalance where poor communities would be unable to bargain for fair prices for goods they could produce (this reduces the amount of money they have to buy food or supplies that would help them to become self-sufficient). Nor did students discuss how lack of money would prevent communities from building good-quality infrastructure to allow more food to be produced (e.g. roads, dams, irrigation systems, electricity systems).

Dot Point 4

This dot point was generally answered well. Most students discussed two long-term strategies thoroughly, with most responses focused on revolving loan funds (or other similar loan schemes), fair trade programs, and education on farming practices and water security. Family planning education was also a common response and was well linked to the key idea of this dot point.

OPERATIONAL ADVICE

The diligence of most teachers in preparing and labelling samples for moderation was appreciated. Teachers are referred to the relevant instructions in the subject operational information on the Nutrition minisite. The inclusion of an approved learning and assessment plan is a requirement, and, when necessary, a signed addendum must also be submitted. A complete set of task sheets, listing the specific features assessed in each task, should also be provided. Teachers should check for consistency between the specific features used on task sheets and those that appear on the learning and assessment plan or addendum.

Only summative work should be included in the student materials, which should be clearly identified with the student's SACE registration number. If a complete set of student work cannot be submitted it is essential that a Variations — Moderation Materials form is completed and submitted. When students undertake an oral presentation, it is important to provide moderators with some evidence such as a transcript or a DVD/CD copy for viewing.

Information and support materials are available on the Nutrition minisite. New teachers are encouraged to seek clarification and advice early in the year by attending a clarifying forum and contacting the SACE Officer — Curriculum. Teachers are encouraged to join and participate in the online community for Nutrition on the Nutrition minisite and also to apply for membership of assessment panels.

Nutrition
Chief Assessor