Nutrition

2011 Assessment Report

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OVERVIEW

Assessment reports give an overview of how students performed in their 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.

In 2011, 584 students from South Australia and the Northern Territory completed Nutrition, a decrease from 803 students in 2010.

SCHOOL ASSESSMENT

General Comments

Moderation was carried out over 2½ days and samples of student work from 46 schools were moderated. A variety of tasks were presented for moderation for both assessment types. The majority were based on support materials available on the SACE website. While most teachers presented appropriate tasks, there were a few examples of practical tasks that have been used prior to this year that were not altered to meet the new SACE requirements. Errors were noted in some teachers' conversions of grades to marks in some spreadsheets, so there is a need for teachers to check the accuracy of this process.

Learning and assessment plan addendums were completed where tasks were altered and in most cases signed off by the school principal or their representative. It was a requirement to have a clean copy of each task for both assessment types included in the package.

Student work was generally clearly labelled. Where student work had missing tasks, clear indicators were given in packages using the appropriate forms. When teachers provided a summary or cover sheet for each student, it assisted moderators to quickly identify appropriate grade level samples for each assessment type and confirm the teacher's assessment. Interpretation of the performance standards overall was good, although many teachers tended to be very generous in the application of grade levels to the specific features of the investigation assessment design criterion relating to the selection, acknowledgment and display of findings.

Assessment Type 1: Investigations Folio (40%)

Some 'old tasks' (pre-2011) were used which potentially limits the ability of students to achieve at the higher grade levels. It was evident that marking schemes rather than performance standards were used in some schools. Most teachers provided a 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

Evidence of performance needs to be provided at moderation for all criteria being assessed, which includes the manipulation of apparatus to implement safe and ethical procedures and the demonstration of skills in individual and collaborative work. Some teachers had awarded high grades for manipulation of apparatus where little or no evidence was provided. The design task needs to have clear details explaining what is expected from the student and how it will be assessed. It is recommended that one or more tasks be provided to allow students to practise designing safe and appropriate scientific investigations. The design of the practical should be assessed prior to students undertaking the investigation, and this should also be submitted for moderation. If a design were inappropriate and likely to prevent students from achieving a successful outcome, it would be acceptable to allow the design to be modified for this purpose. In such instances the original design mark should stand. Some practical investigations did not allow or enable students to demonstrate their design skills and analysis and evaluation at the highest grade band. Formation of the hypothesis requires significant scientific precision, and should include the manipulation of one independent variable only.

Generally the investigation and design skills were satisfactory. Many students needed to focus on the ability to generate summary data with appropriate tables and graphs. Some students used line of best fit to show data, but this was not always used appropriately, and an understanding of how discrete and continuous data are represented will improve this aspect of report writing. Constructive comments written by teachers on student work enabled moderators to see clearly why particular levels of the performance standards were selected for that assessment.

Food preparation tasks that involved changes to dietary needs and links to sensory evaluation allowed for a high level of analysis. Where extensive discussions occurred (for example, Food-Works analysis), consideration should be given to setting a word-limit to develop concise analysis and evaluation communication skills. Concise and clear summaries of findings are needed. Presentation of data, high levels of ICT skills, and quantity of work were often rewarded rather than the analysis of data.

Issues Investigation

It is important to ensure that the issues investigation does, in fact, investigate a nutritional *issue*. Some 'issues' were projects, topics, or research tasks. Students need to discuss the arguments both for and against components of the issue. The word-limit was adhered to and provided opportunities for concise analysis and reporting.

Assessment Type 2: Skills and Applications Tasks (30%)

There was a tendency to use tests and past exam papers as the basis of assessment in this assessment type for the majority of schools. The exam questions in particular should provide stimulus and be altered slightly to ensure that students are being challenged. Extended-response questions ensured students were able to critically apply, analyse, evaluate, and synthesise at the highest level. The use of multiple-choice questions is suitable for informal assessment of knowledge, but should not

form part of the formal assessment of skills and applications tasks. A small number of teachers created assignment tasks that allowed student to demonstrate their skills and applications. Teachers are encouraged to use a variety of forms of assessment that provide students with different opportunities to demonstrate their knowledge and understanding, and should refer to the examples on the SACE website.

EXTERNAL ASSESSMENT

Assessment Type 3: Examination

General Comments

The mean score for the 584 students who sat the 2011 examination was 56.7z%. The table below provides information for the last three years.

Year	Enrolment Numbers	Examination Mean (%)
2011	584	56.7
2010	803	59.1
2009	898	65.6

The examination is composed of two parts: short-answer questions worth 100 marks and an extended-response question worth 20 marks. In the short-answer section, 2 marks are awarded for each well-expressed, relevant, piece of information. A question worth 4 marks usually indicates that two pieces of relevant, well-expressed and connected pieces of information are required. Questions where 3 marks are awarded usually require a student to state, for example, a name, and then connect to, for example, a description. The extended-response section comprises two questions and students select and answer the question corresponding to the option topic they have studied as part of their coursework. This section usually has four main points that students should address sequentially. Each point is worth 4 marks, which usually indicates that two pieces of relevant, well-expressed, and connected pieces of information are required. A further 4 marks are awarded for communication.

Overall, average marks in the short-answer section show that this year's cohort could demonstrate evidence of learning in most aspects of the compulsory components of the course. However, average marks in the extended-response section suggest that students had difficulty using and connecting nutritional understanding to broader issues related to global nutrition and ecological sustainability, or global hunger.

Teachers and students are reminded of the following:

- Students are encouraged to use past exam questions to practise reading questions carefully to improve their ability to interpret exam questions. These exams are available on the SACE website.

- Students should be familiar with the meaning of words that are used in exam question stems; for example, 'name', state', 'explain', and 'describe'.

- Successful students were able to use specific terminology found in the subject outline, and all students are encouraged to familiarise themselves with the

content of this document. This includes the 'Nutrition Investigation Skills' section of the subject outline, as some students clearly struggle with some of the concepts and skills described in this section. The problem was evident in Question 4 of the exam, which focused on investigation and design skills, and which appeared to be challenging for many students. It highlights the need for more explicit instruction in scientific methodology.

Specific comments on each question in the exam are given below.

PART 1: SHORT-ANSWER AND ANALYTICAL QUESTIONS
(Questions 1 to 8)

Question 1 (Mean 60.3%, SD (standard deviation) 20.33%)

(a) This section was generally well answered, but some students did not read the question carefully and did not follow the instruction to write the corresponding letter (A, B, C) next to the appropriate line. While most students correctly identified the large intestine and salivary gland, the gall bladder was less well known.

(b) The key word, 'by-product', was poorly understood by many students. The most common incorrect responses included amino acids, lipids, and enzymes involved in digestion.

(c) This question required students to focus on the role of the stomach in digestion, and to describe one physical and one chemical role of this organ. Students are encouraged to read questions carefully, as some students described the role of the mouth and the oesophagus in digestion. Higher-achieving students provided detailed descriptions, using appropriate terminology for each section. Many students were able to describe the physical role of the stomach in simple terms, but did not elaborate on the reason for processes such as churning. Chemical digestion was less well understood, and a common misconception was that pepsin breaks down proteins into amino acids.

(d) Parts (i) and (iii) were generally well answered by the majority of students. Although many students were able to name the site in the digestive tract that is responsible for the absorption of lactose, a common incorrect answer for part (ii) was the stomach, which indicates that detailed knowledge of the digestive system needs further reinforcement.

(e) Higher-achieving students answered this part very well, giving detailed descriptions of one basal metabolic process. Students are encouraged to read the question carefully, as many described aspects of digestion and physical activity rather than a basal metabolic process.

Question 2 (Mean 54.62%, SD 24.35%)

(a) Many students did not comprehend the significance of 'children' in the question stem for part (i), while adults aged 45–60 years old in part (ii) were frequently described as elderly and inactive. These responses were not linked to the Measure Up campaign. Higher-achieving students successfully made the link between the goals of the Measure Up campaign and the two targeted age groups. Such responses focused on an individual's use of a simple tool (waist

measurement) to monitor and regulate body size, and becoming aware of health issues and modelling good practices for others.

(b) Most students were able to name a diagnostic tool, but did not adequately describe how it helps improve diet, lifestyle, and health.

Question 3 (Mean 62.17%, SD 20.19%)

(a) This was poorly answered. Many students described the production of cholesterol, rather than stating a function of cholesterol in the human body. Incorrect answers tended to focus on the function of lipids rather than cholesterol. The most common correct response related to the role of cholesterol in the cell membrane.

(b) This part was generally well done, with the majority of students able to connect high blood cholesterol to the process of atherosclerosis. Higher-achieving students correctly used formal nutritional terminology in their responses.

(c) This was generally well answered. Many students outlined the role of HDL in general terms, but responses from higher-achieving students were more detailed and they used specific terminology correctly. Students are encouraged to refrain from using terms such as 'good' or 'bad' cholesterol in formal written responses.

(d) In part (i), most students correctly identified the trends in LDL cholesterol and HDL cholesterol. However the best responses made use of the data provided in the graph. In part (ii), dietary strategies were generally appropriate, but students are advised that when asked for two strategies, it is expected that they provide two distinctly different strategies. The description of a lifestyle strategy in part (iii) was not as well done. Some students gave another dietary strategy while others gave an appropriate lifestyle strategy but did not elaborate upon it. For example, many students indicated, correctly, that exercise could be used to further lower total cholesterol level, but failed to link it to the protective effect of increased levels of HDL cholesterol. Finally, part (iv) was generally well done, with most students able to use data from the graph and the table to compare the level of LDL cholesterol at 6 months against a reference range.

Question 4 (Mean 56.96%, SD 18.82%)

(a) Many students struggled to write a suitable question that addressed the impact of the campaign in helping people to improve their diet, lifestyle, and health. When students narrowed the focus of their proposed question to one dependent (outcome) variable (either diet, lifestyle, or health), the quality of the question improved, and this focus allowed them to design a meaningful procedure.

(b) Although many students did not propose a coherent procedure or did not logically sequence procedural steps, most were able to suggest at least one step in an investigation.

(c) The term 'reliability' did not seem to be well understood. Many students gave one example of a factor that needed to be held constant in an experiment, but often it was irrelevant in the context of their question.

(d) Most students were able to state a possible source of error.

(e) It was pleasing to see in part (i) that many students were able to construct an appropriate graph to represent the data from the table. Students should remember that all graphs require a descriptive title, and axes that are suitably scaled and labelled. A common error was labelling the vertical axis with 'Level of Understanding', rather than 'Numbers of People'. Some students also used a line graph, which is not appropriate for discrete data. Most students were able to accurately plot data, and provide a legend. Part (ii) was generally well answered, and better responses used the data to support their conclusion. Part (iii) was poorly answered, with the most common incorrect responses being to increase the number of age groups or make the age intervals smaller. A few students suggested, correctly, that the numbers of respondents should be the same for each of the age groups.

Question 5 (Mean 55.39%, SD 22.83%)

(a) This question was generally well answered, provided that the student understood the term *physiological*. Some students described *psychological* factors instead, showing an inability to distinguish the two terms. It is suggested that students consult an approved dictionary if they are uncertain of the meaning of a key term.

(b) Most students were able to identify two factors that could contribute to the elderly man's iron deficiency anaemia. Social factors were most often given, with few students able to provide psychological reasons that could have contributed to the disorder.

(c) This question required students to link the nutritional benefits specifically to the elderly man described in the scenario. Many of the responses were too general in nature (for example, fruits and vegetables provide vitamins and minerals) and thus students were unable to link the nutritional advice to the specific needs of the elderly man. Some students suggested that foods that were less energy-dense could help the elderly man to avoid weight gain, thereby demonstrating a lack of understanding of the question.

(d) Economic factors were well understood by the majority of students.

(e) A range of appropriate strategies was suggested by students in terms of a food selection method in part (i), but part (ii) was poorly done. Storage methods were the most common incorrect response made by students in terms of food preparation methods. The most common correct responses described methods that minimised loss of nutrients, such as steaming or microwaving, or that avoided soaking foods in large amounts of water for extended periods of time.

Question 6 (Mean 64.01%, SD 21.23%)

(a) This was well answered, with many students using the data given in the table as evidence for the statements they were making.

(b) It was evident that many students misunderstood the phrase 'maximises nutritional value'. Better responses commonly identified that the short cooking time would maximise nutritional value. Other appropriate responses referred to the thickness of the pancake or the use of fresh ingredients with minimal processing.

(c) The majority of students were able to justify a suitable modification.

(d) This question was also answered quite well by the majority of students, although students should be careful to ensure their response has sufficient detail to justify full marks.

(e) Part (i) was generally well answered, provided that students read the question carefully. The key point was to identify how the information label did not conform to Australian law, a point some students failed to grasp. Part (ii) was well done by the majority of students, indicating that students understand the concept of a nutritional claim.

Question 7 (Mean 62.25%, SD 18.85%)

(a) Most students were able to correctly calculate the total energy content of the foods listed in the table. The most common error was confusing the kJ/g values for protein (17kJ/g) and carbohydrate (16kJ/g). However, even when a mistake was made, some marks could still be given for the process, so it is important for students to show all their calculations in the space provided.

(b) Only a small number of students correctly calculated that the bushwalker had a negative energy balance.

(c) Part (i) was well done, with the majority of students able to identify and justify an appropriate food that met the energy requirements of the bushwalker. A small number incorrectly identified chocolate cake as a suitable food. Part (ii) was also well answered. The most common correct response in part (iii) was an orange, and most students were able to justify their response.

(d) This question was poorly answered. A low level of knowledge and understanding of preservation and packaging methods was evident in student responses. In part (i), many students were unable to identify the preservation method used for their chosen food, and they were unable to describe in detail how the method would reduce the risk of food poisoning in part (ii). Similarly, in part (iii), students struggled to suggest packaging material suited to the walking conditions or explain why it would be suitable.

Question 8 (Mean 69.65%, SD 25.26%)

(a) The majority of students correctly stated one function of vitamin C in the human body.

(b) The majority of students correctly interpreted the trend between Day 0 and Day 10, and used the data in the table to support their statement. Students are again reminded to read questions carefully, as a small number compared Day 0 and Day 20.

(c) Most students correctly identified Sample B but did not make an appropriate link with the gas mixture in the package (specifically, oxygen).

PART 2: EXTENDED-RESPONSE QUESTIONS ON OPTION TOPICS
(Questions 9 and 10)

GENERAL COMMENTS ON THE EXTENDED-RESPONSE QUESTIONS

Many students showed clear evidence of planning responses to the appropriate question in this section. Dot points were responded to in the order given, and paragraphs contained relevant information using acceptable terminology. Some students continue to write introductions and conclusions, which are not required for this format. Students are also reminded that only one question in this section should be answered, and that they should write the question number on the front page of the script book in the appropriate place.

Option Topic 1: Global Nutrition and Ecological Sustainability

Question 9 (Mean 48.54%, SD 19.48%)

The majority of students addressed the potential impact of increasing land-use pressures on future food supply in sufficient depth. The most common, and obvious, response linked population expansion to a reduction in land available for farming.

It was common for students to suggest more than one government strategy that could be implemented to ensure a more secure supply of fruits and vegetables in Australia. Students are reminded to read the question carefully and respond appropriately. Student responses often lacked depth, with little specific detail provided about the suggested strategy. It was uncommon for students to explain how this strategy would contribute to a secure food supply. The most successful responses described a specific government initiative (for example, targeted funding of research programs through organisations such as SARDI), and then discussed how it would contribute to food security in Australia.

Many student responses about the impact of world population increases on Australian food security also lacked detail, and responses were very general. For example, while most students understood that increasing population meant greater demand for food, very few discussed the impact on Australian food security.

The impact of import and export of food on the environment was well done. The concept of food miles was the most popular answer and the majority of students were able to provide excellent information on how fossil fuels impact on the environment and, ultimately, on biodiversity and food production.

Option Topic 2: Global Hunger

Question 10 (Mean 46.77%, SD 22.85%)

Most students were able to discuss links between a secure water supply and increased food production. The majority focused on the need for sufficient uncontaminated water at the appropriate time to enhance yields. The second most common response focused on the provision of potable water so that workers could remain healthy and able to contribute to food production.

The majority of students discussed the importance of education in promoting food production for growing populations very well. The most successful students clearly identified specific aspects of education that would be of most benefit in food production. These included education that focused on farming practices, the cooking

and storage of food (and hence minimising wastage of food), or developing skills that could improve food production.

Many students struggled to describe the positive aspects of a stable government that would create the conditions necessary to ensure a secure food supply, and focused their answer on the impact of unstable government instead. The most successful students described benefits of stable government — for example, the ability to build and maintain infrastructure (for food storage, manufacturing, and transport), or the ability to negotiate trade agreements with other nations — and then elaborated using specific examples as support.

Most students were able to identify several nutritional consequences of insufficient food, but some did not follow up with sufficient detail. Some students simply listed a range of disorders, but students are reminded that a list is not a discussion. Incorrect answers included osteoporosis, diverticulitis, and death. The most successful students were able to name more than one deficiency disease, and provide details of the nutrient involved and the effects of the deficiency.

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