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SPORTS, EXERCISE AND HEALTH SCIENCE

Overall grade boundaries

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 17	18 - 34	35 - 46	47 - 56	57 - 67	68 - 77	78 - 100

General comments

This was the second May session for the Sports, exercise and health science pilot course (SEHS) and it was a pleasure to moderate teachers who had clearly taken time and trouble to make sure their practical programmes were appropriate and in line with the Internal Assessment (IA) criteria. In most centres the criteria were applied rigorously.

Standard level internal assessment

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 8	9 - 16	17 - 22	23 - 27	28 - 33	34 - 38	39 - 48

General comments

Teachers who included the "complete", "partial" and "not at all" breakdown of their marks were providing helpful information to the moderators. This, combined with comments and feedback to the candidates, made it very clear as to how the teachers were awarding marks. Clearly all teachers of SEHS took a lot of time and trouble to prepare their (IA) sample. This effort is very much appreciated. They should be congratulated for their efforts and their candidates will reap the benefits. It is a lot easier for a moderator to support a teacher's marks when there are clear notes accompanying the sample.

Teachers must enclose all instruction sheets and/or summaries of oral instructions for the investigations in the moderation sample. Most centres complied with this requirement. Furthermore, when Data collection and processing (DCP) is being assessed, the method (designed by the candidate or provided by the teacher) is required. When Conclusion and evaluation (CE) is being assessed, all the steps in the scientific process are needed for moderation.

It would be helpful if the full IA title (candidate) was included on investigations on the 4/PSOW form as it would be easier for the moderator to match up the candidate work which was to be assessed.

If only one member of staff is delivering the SEHS course a valuable exercise could be to link and work with the Biology Department within the centre to ensure internal standardization has taken place.

Overall, teachers entered several marks for each criterion from a variety of investigations. This is very encouraging to see. Where several marks appear it implies that the candidates are receiving adequate feedback as they proceed through the practical scheme of work. One can even see the learning curves of candidates who pay attention to this feedback.

Some centres sent photocopies of the candidate work. Usually these were of good quality. The problem is that graphs and diagrams using colour can be confusing. It would be better to send the originals and keep back a photocopy.

Note: atypical candidates should be replaced in the sample. These would include candidates whose work is incomplete or transfer candidates where a substantial part of their work has been marked by another teacher.

The areas of the programme that proved difficult for the candidates

Candidates must ensure that their investigations have the potential to generate sufficient data for substantial processing. Ideally, the designs should aim to have 3-5 repeats for each variable. Many candidates were missing quite obvious conventional points (e.g. indicating uncertainties in their data). Teachers are also missing these points and a few were marking over generously.

There was evidence that literature sources were being consulted to provide valuable background information in determining the initial research question and in the discussion of the results. Teachers could further challenge their candidates to add value to their own data findings by referring/comparing/contrasting with an existing data/theory reference. Candidates also need to be cautious when relying solely on websites regarding references. The Internet is to be used to complement more quality assured sources. Care is needed in the correct ways to present citations of references.

Only processed data is to be presented graphically and the x and y-axis must be clearly labelled. When candidates use error bars on graphs, there needs to be an indication of what these values represent.

Many candidates missed out on full marks for their evaluation, as they did not discuss the significance of the error and only identified relevant weaknesses.

The levels of knowledge, understanding and skill demonstrated

The variety of investigations, and the duration and coverage of the practical programme were generally good. The quantity and type of data was very good in some schools and adequate in the majority of schools.

Rules applied by the moderators

In the event of the teacher providing too much guidance to the candidates or ignoring the criteria, the following scale is applied by the moderators:

Criterion	Problem	Teacher awards	Maximum moderator can award
Design	Teacher gives the problem or research question.	c; c; c = 6	p; c; c = 5 Candidates could have identified their own control variables.
Design	It is clear that the candidates have been told precisely what apparatus and materials they require and have not modified it.	c; c; c = 6	c; c; n = 4
Data collection & processing	The candidates have used a photocopied data table with headings and units.	c; c; c = 6	p; c; c; = 5 Candidates could have added uncertainties or relevant qualitative observations.
Data collection & processing	The candidates have been told, on the method sheet, to draw a graph from their raw data and which variables to plot or process the data in a particular way.	c; c; c = 6	c; n; c = 4
Conclusion and evaluation	The candidate has only indicated as a criticism that they ran out of time and their only suggestion as an improvement is that they should repeat the investigation.	c; c; c = 6	c; n; p = 3

The Criteria

Design (D)

The programme requires that the investigations assessed should contain quantitative data. There were no cases of centres presenting only qualitative data. Associated qualitative data is, however, to be expected.

The three categories of variables must be clearly identified. Candidates need to be taught what the different variables are and what their relationship is. The range of values of the independent variables was usually sufficient to establish trends. The number of repeats was not always sufficient to permit statistical analysis. The type of statistics being performed was of a good level in most cases.

Research question/focused problem is different to the teacher prompt and should include the dependent and the independent variables. The variables stated in the research question must be those that are directly measured.

Teachers need to set general themes with plenty of scope for different investigations. Teachers need to avoid situations where the whole class is attempting the same investigation. Teachers should not be afraid to counsel candidates away from investigations that will lead to trivial results.

It is good practice for candidates to follow through their own designs, which most centres seem to be doing.

Standard protocols will, no doubt, be used by the candidates when they design their investigations. We are not expecting them to re-invent the wheel. However, these standard protocols must be significantly modified or applied to the candidate's own investigation. For example, if fitness is being investigated and the candidate uses the Harvard step test, this is legitimate. If the investigation is simply to determine the fitness of one person then it remains trivial and it repeats many textbook investigations. If the investigation is used to determine the effect of a particular training programme on fitness levels, the investigation becomes more substantial. When candidates design investigations that require different individuals as subjects they should consider the problems of obtaining a representative sample.

Data collection and processing (DCP)

It may be that class data is required in order for the candidate to gain access to sufficient data for significant data processing and the determination of uncertainties. The moderators understand this. If class data is to be used and DCP is to be assessed, a number of precautions must be respected. The candidates must present their own data and this can be achieved either by (1) presenting their own data first or (2) clearly identifying which is their own data in a pooled data table. The candidates must plan and produce their own data table. Copying a table from other candidates will be counted as collusion. Teachers who provide the candidates with a pre-formatted data table can expect their candidates to be moderated down.

Where the moderators had to reduce the marks of the teachers it was for the following reasons:

- No uncertainties were given in the tables of data collected using measuring instruments

- There were inconsistent decimal places in tables

- The decimal places did not correspond to the precision of measurements

- The processed date (2 decimal places) on occasions has a higher degree of precision than the raw data

- Lack of data meant that individual averages could not always be processed

- There were no associated qualitative data

- Raw data were plotted in graphs that do not actually reveal anything (e.g. maxima, minima, optima or intercepts)

- Raw data were plotted when the mean should have been calculated and plotted

- There was no statistical treatment of the data

- There was no presentation of uncertainties in graphical data either by using trend lines or error bars

- The error bars, when used, were not identified or accompanied by a explanation of what these values mean

- Trend lines were not used to express uncertainties.

- Tables did not have a descriptive title containing both the dependent and independent variables.

Complete may not mean perfect but when the mistakes are consistent they will have an impact on the moderated marks.

When calculations are made it is important that the pathway to the answer is clear. This does not mean there has to be a worked example but a result that springs up out of nowhere will not be credited.

Conclusion and evaluation (CE)

As a rule, the teachers were encouraging the candidates to collect sufficient data so that conclusions could be drawn from the results. This is a good sign and it is to be hoped that it continues. On occasions, the statistical analysis was sufficient to reveal relationships between the variables and their degree of significance.

Generally, the candidates consulted literature values.

Candidates in some centres show that they have developed a mature sense of criticism of the investigation. Their evaluation of their results is based upon a balanced critical analysis of the data. Candidates who have not developed this skill tend to remain superficial in their evaluation. The weaknesses they identify are hypothetical without evidence to back it up. For weaker candidates, the experimental weaknesses are restricted to having a limited amount of time or errors in their own manipulation that once again remain hypothetical ("I could have incorrectly measured the temperature").

Candidates should describe at least 3 major errors and suggest a sensible improvement. The evaluation could also be presented as a table: (1) Error, (2) significance of error and (3) suggested improvement. The inclusion of a separate column for the significance of the error helps draw candidates to the importance of discussing the significance of the error in addition to solely identifying weaknesses. Suggested modifications were superficial from weaker candidates but the teachers were in general identifying this and marking appropriately. Evaluation is a good discriminator of the high achieving candidates and teachers would do well to remember this when they are marking their candidates' work.

Manipulative skills (MS)

There is evidence of the candidates being exposed to a sufficient range of investigations. This ensures that the manipulative skills can be assessed correctly.

Ethics and Safety

SEHS will inevitably involve investigations using human subjects. Safety must be paramount to investigations. Using fellow candidates for investigations into the effect of exercise on the heart rate can be considered unsafe if the health status of the candidates is not determined first. The International Baccalaureate (IB) does not wish to inhibit investigations but it does want to stimulate a responsible attitude towards experimentation. The safety and ethics of science investigations have been reviewed and the animal experimentation policy has been posted on the Online Curriculum Centre (OCC).

This, and the Ethical Practice Poster, also available on the OCC, will be applied to future Internal Assessment moderation. If necessary, teachers may need to make adjustments to their Practical Scheme Of Work especially where human volunteers are involved. Candidates could also be encouraged to report briefly on any ethical issues, which arise during their investigations e.g. ensure confidentiality of participants.

ICT coverage

There was evidence of excellent ICT coverage by some centres.

Centres seem to have made an effort to equip themselves with the necessary materials to carry out data logging. However, the use of this material in investigations for internal assessment of the criteria needs to be carried out with care. Teachers and candidates are strongly advised to read the relevant section of the subject guide.

Graph plotting using software was perhaps the easiest and most widespread for centres to apply. However the signs are that some candidates still need to be taught the correct conventions of graphing.

There is a tendency to use bar charts for everything amongst the weakest candidates, perhaps because it is the default setting. Legends (keys) are not always necessary and some candidates do not seem to know how to de-select them. When they are needed the candidates often have difficulty labelling them appropriately – candidates often present the different curves as "series 1" and "series 2". When candidates used a scatter plot, a trend line was not always used when it was appropriate.

The use of spreadsheets for data processing was less apparent in the moderated investigations. When spreadsheet tables are inserted into document files the conventions of presenting tabulated data still need to be ensured (e.g. Centring numbers, adjusting the number of decimal places, column headings).

The Group 4 Project

This project was used correctly for assessment of Personal Skills (PS) and no other criterion. Evidence of participation in the project does not need to be presented unless the IB specifically requests it.

The type of assistance and guidance teachers should provide for future candidates

- Read the feedback from this session and act upon it.

- Consult the OCC for Teacher support material (TSM) for the IA component of the course. The TSM shows application of the criteria in the assessment of practical work. It consists of a series of investigations or part investigations by candidates that have been assessed by moderators using the assessment criteria.

- Apply the internal assessment criteria rigorously.

- Ensure that the open-ended theme that you set has enough scope to provide a variety of research questions.

- Give the candidates experience in identifying independent, dependent and controlled variables.

- Encourage the candidates to make additional observations about their experiment.

- Ensure that the investigations have the potential to generate sufficient data for substantial processing.

- Teach the candidates that plotting graphs of raw data is often insufficient.

- Encourage the candidates to carry out research into the background literature both before starting an investigation and once the results are complete.

- CE Aspect 1 (concluding) should include data to back up findings and reference to the appropriate statistical test to discuss the significance of the data.

- **Do not** use the Group 4 Project for assessment of D, DCP, CE or MS. The group 4 project is to be used to assess Personal Skills **only**.

- Make sure the current version of the 4/PSOW form (available on the OCC) is used.

- Check to be sure that all the parts of the 4/PSOW form are completed correctly.

- Only the work for the candidates selected through IBIS is required to send for moderation.

Standard level paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 7	8 - 12	13 - 18	19 - 20	21 - 23	24 - 25	26 - 29

General comments

Each session, teachers are invited to submit comments via G2 forms. A single G2 form was submitted for this component; it is hoped that more will be submitted in future sessions.

The level of difficulty of the paper was deemed appropriate. Syllabus coverage, clarity of wording and presentation of paper was rated as good. The difficulty index (i.e. the proportion of candidates giving the correct answer for each question) supports that there is a good spread of marks across the paper. The discrimination index (i.e. the extent to which a question distinguishes between the more able and the less able candidates) varied from 0 to 0.83. There were no questions with a negative discrimination index (i.e. those which the more able candidates tended to get the wrong answer). There appear to be a good number of discriminating questions on this paper, with a smaller number that did not seem to discriminate well.

The following topics/sub topics were done really well: 3.3 Nutrition and energy systems; 2.1 Structure and function of the ventilatory system; 4.1 Neuromuscular function; 6.3 Principles of training programme design.

In general, the following areas were good but could be improved upon:

3.2 Carbohydrate and fat metabolism; 4.2 Joint and movement type; 5.3 Principles of skill learning.

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The following areas evidenced some weaknesses and should/need to be improved upon: 1.1 The skeletal system; 2.2 Structure and function of the cardiovascular system; 3.1 Nutrition; 5.1 The characteristics and classification of skill; 6.1 Statistical analysis.

The strengths and weaknesses of candidates in the treatment of individual questions

The candidates were very well prepared for the following questions: 6 (2.1.7); 10 (2.2.5); 14 (3.2.2); 15 (3.3.1); 18 (4.1.1); 20 (5.3.2); 21 (5.1.1); 26 (5.2.10/5.2.9/5.2.8); 30 (6.3.3).

The candidates were NOT well prepared for the following questions: 1 (1.1.9 Outline the features of a synovial joint); 3 (1.1.5 Apply anatomical terminology to the location of bones); 8 (2.2.6 Describe the relationship between heart rate, cardiac output, and stroke volume at rest and during exercise); 28 (6.1.5 Outline the meaning of coefficient of variation).

Question 1

The majority of candidates chose the correct option (D). It has been noted that the term 'menisci', does not appear in the teacher's notes (1.1.9).

Question 3

This question had a good distractor (option A) but a low discrimination index (0.13).

Question 4

Terminology is a potential issue here. Some of the names and/or alternatives of the valves listed as potential answers are not stated in the guide. An expansion of the teacher note will be considered at the next curriculum review.

Question 8

This was a good discriminating question, which asked the candidates to carry out a simple calculation (NB calculators are <u>not</u> permitted in paper 1).

Question 13

This question was discounted, on the basis that the teacher's notes have been corrected in the guide, but the amendment in the SEHS Guide was not available/circulated to schools before the examination.

Question 14

It is noted that option 'D' was not a good distractor. 90% of candidates chose the correct option.

Question 16

This question had a sound discrimination index (0.33). Option 'B' proved to be a good distractor.

Question 19

It was not necessary to include the word 'isotonic' within options 'B' and 'D'. The wording of this question has been amended to reflect this.

Question 22

This question had a discrimination index of 0.33 (i.e. within the ideal range), with 54% of candidates choosing the correct option (B).

Question 23

This question had a discrimination index of 0.46 (i.e. within the ideal range), with 62% of candidates choosing the correct option (B).

Question 30

This was the easiest question on the paper, with 100% of candidates able to identify the purpose of monitoring heart rate during running. This question did not discriminate at all (discrimination index of 0.00).

Standard level paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 6	7 - 13	14 - 18	19 - 24	25 - 30	31 - 36	37 - 50

General comments

Only three G2 forms were received for paper 2, and this means that one should be cautious about drawing any firm conclusions. All reported the level of difficulty as appropriate. Syllabus coverage, clarity of wording and presentation was rated either satisfactory or good.

The areas of the programme that proved difficult for the candidates

It is essential that candidates read the questions carefully. Candidates need to know and understand that examination questions are always written using the 'action verbs ('command terms'), the meaning of which is precisely set out in the subject guide. For example, some candidates failed to notice that they were asked to 'outline' e.g. Question 7(b)(ii). Candidates who simply 'listed' could not gain all the marks for that question.

In section A the following areas seem to have proved difficult for <u>some</u> candidates:
principles of training programme design (6.3.2); structure and function of the cardiovascular system (2.2.15); fundamentals of biomechanics (4.3.8 and 4.3.10) and information processing (5.2.14 and 5.2.15).

In section B, there was a reasonable spread of candidates answering question 5, 6 or 7. A number of candidates struggled with question 5 (b), nutrition and energy systems (3.3.9); question 6 (a) principles of skill learning (5.3.7) and question 6 (c) information processing (5.2.7); question 7 (a) principles of training programme design (6.3.1) and question 7 (b) (ii) components of fitness (6.2.2). However, it must be stressed the some candidates had no difficulty with each of the above areas.

The levels of knowledge, understanding and skill demonstrated

There appears to be a spread of marks across both sections A and B. On the whole, the majority of candidates seemed to have an understanding of what was expected of them in this paper. However, it was anticipated candidates would have a firmer grasp of:

- the ways in which exercise intensity can be monitored

- the variability of maximal oxygen consumption

- the application of Newton's laws of motion to sporting activities

- the concept of angular momentum in relation to sporting activities

- the role of feedback in information processing models and with the learning process.

There were candidates who demonstrated a high level of knowledge and understanding of these topics in their answers. As expected, the Objective level 3 questions, i.e. the more conceptual aspects, clearly differentiated in relation to the content knowledge and understanding of candidates.

The strengths and weaknesses of candidates in the treatment of individual questions

Question 1

Part (a), (b) and (c) were generally done well, but (d), (e) and (f) could be improved. Many candidates struggled with calculating the aerobic training zone using the Karvonen method (e). Very few candidates referred to the concept of 'individuality' in part (f).

Question 2

There was a real contrast in the quality of responses with some candidates evidencing a lack of conceptual understanding in parts (a), (b) and (c).

Question 3

Part (a) was not done well. It is possible that many candidates confused this feedback question with a type of practice (e.g. visualisation/imagery) and this may have contributed to the poor quality of answers. Part (b) was done well and, on the whole, candidates appeared to have a good grasp of the difference between knowledge of results and knowledge of performance.

Question 4

All parts were answered well. A good question for the majority of candidates.

Question 5

Some candidates showed an impressive level of knowledge and understanding, evidenced in the quality/depth of answers. However, a signficant number of candidates did not remain focused on the 'aerobic' aspect of the question [part (b)] and deviated - with sound content - into the anaerobic system. Unfortunately, marks were not awarded for this. In 5 (d), some candidates confused weight relative oxygen uptake with body mass index.

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Question 6

In part (a), some candidates outlined a lot of information about one type of practice, but the challenge was to do this (i.e. outline) for three types of practice. Part (b) was answered to a very high standard by some candidates and soundly by the majority who answered this question. There is still some confusion around knowledge and understanding of the reciprocal teaching style [6 (c)]; very few candidates could describe the reciprocal teaching style.

Question 7

This was potentially the 'easiest' question in Section B, however this did not seem to be evident based on the poor quality of some of the answers. In part (a), quite a number of candidates confused 'elements' with 'principles'. In part (b)(ii) many candidates simply listed components of fitness i.e. they did not outline.

The type of assistance and guidance teachers should provide for future candidates

- Teachers should consult the online curriculum centre (OCC) frequently for teacher support materials

- Familiarise candidates with the format and types of questions used in paper 2

- Teach drafting/planning for sections of questions set at Objective level 3 with specific focus on recognising the 'action verb' associated with the question, for example:
  question 1(f) - the use of the action verb 'explain' needs more guidance in order for candidates to answer the question;
  question 7(b)(ii) - candidates need clarity about the difference between the action verb 'outline' as opposed to 'list'.

- Teach drafting/planning with a focus on the action verbs, especially those set at Objective level 3

- Try to improve the candidates knowledge and understanding of:

  - the Karvonen method (including **how** to calculate training zone) to monitor exercise intensity;

  - how to explain the variability of maximal oxygen consumption in selected groups, specifically with reference to weight relative oxygen uptake;

  - the application of Newton's laws of motion to sporting activities and the concept of angular momentum in relation to sporting activities;

  - forms of intrinsic feedback in information processing models and with the learning process.

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Standard level paper three

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 7	8 - 15	16 - 18	19 - 22	23 - 25	26 - 29	30 - 40

General comments

There were no G2 forms for paper 3.

The paper generated a range of responses demonstrating sound knowledge and skills within many candidates. The responses indicated that appropriate information and teaching had been made available to candidates. Few questions generated poor responses from all candidates or within one centre. In many cases, candidates were able to respond well to Objective 1 and 2 questions but not so well on Objective 3 questions. Interpretation of data provided in questions was quite well dealt with by candidates who were in most cases able to extract specific information and relate to concepts.

The areas of the programme that proved difficult for the candidates

The following areas seem to have been difficult for some candidates:

- psychological skills training (B.4.2)
- mental preparation for sport (B.3.4)
- nutritional strategies (D.4.7)
- water and electrolyte balance (D.2.6)
- energy balance and body composition (D.3.3).

The levels of knowledge, understanding and skill demonstrated

Overall, the candidates demonstrated a fair knowledge and understanding of the options. There is a spread of total marks for this paper and, on the whole, many candidates seem to have a reasonable grasp of the expectations for this paper. It is notable that some candidates evidenced a first class understanding of:

- environmental factors & physical performance (A.2.4; A.2.9; A.2.3)
- non-nutritional ergogenic aids (A.3.3; A.3.5)
- mental preparation for sport (B.3.2)
- psychological skills training (B.4.1; B.1.1)
- hypokinetic disease (C.1.4; C.7.5)
- water and electrolyte balance (D.2.1).

Responses given by candidates to Objective level 3 questions ranged from comprehensive answers that remained focused on the questions and provided authoritative responses to the questions; satisfactory responses, generally accurate, but presented rather descriptively; and responses that contained inaccuracies, omissions and/or misunderstandings

The strengths and weaknesses of candidates in the treatment of individual questions

Options A and B were the popular options, followed by D. It is good to observe that some candidates are now taking option C.

Option A

This option was generally answered well by many candidates. Candidates should engage with a higher order response to some questions, such as Question A2 (b) - 'monitor hydration status to maintain euhydration' rather than just advising to 'take in a lot of water'. However, there were some first class responses from some candidates. Question A3 was answered well but some candidates identified an actual substance rather than the ergogenic group (i.e. caffeine rather than stimulant). In A3 (b), some candidates missed the opportunity for marks because they did not 'discuss', opting to 'list' in bullet point form.

Option B

Generally, the responses provided by candidates to B1 (a) support that most have a sound grasp of theoretical approaches to arousal. It is important to highlight that candidates must answer the question. For example, for B1 (b) some candidates missed out on marks because they did not answer 'why' i.e. they had content knowledge of psychological skills training but did not answer the question. Responses to questions B3 (a) and (b) were disappointing suggesting that candidates have barely a superficial knowledge and understanding of the concept of goal setting.

Option C

Candidates clearly have a firm grasp of the link between physical activity and hypokinetic disease (C.1.4 and C.1.5) and strategies for enhancing adherence to exercise (C.7.6). Candidates struggled with question C3, the interaction between both physiological and psychological factors that underpin the process of how exercise enhances psychological well-being.

Option D

It appeared that candidates are less secure in their knowledge and understanding of Option D compared to other options. In D1 (a) and (b) there was evidence that some candidates were less secure in their understanding of both the interaction of carbohydrate loading and training programme modification prior to competition and, perhaps more importantly, **methods** of carbohydrate loading and training programme modification. There was evidence from some candidates of very good content knowledge of this topic but they did not answer the question, which was focused on methods. In D3 there was a wide range of answer quality. Some candidates were excellent - really first class. However, there was a clear weakness of basic understanding of both structure and function of the maintaining water balance of the blood with some candidates. Candidates could strengthen their answers to question D4 on the relationship between energy expenditure and intake (D.3.3) - this should not be a difficult concept to grasp if taught well.

The type of assistance and guidance teachers should provide for future candidates

- Ensure that candidates are familiar with the definitions of the action verbs suggest, discuss, explain, outline, describe, distinguish

- Ensure that candidates both read and address the question specifically rather than simply writing down everything they know about a topic

- Encourage candidates to draft key elements of possible answers, to help contribute to clarity of response, especially for Objective 3 questions

- Regarding content knowledge, try to improve understanding of the following:
how to monitor hydration status;
why psychological skills training is undertaken;
basic knowledge **and examples** of process goals;
physiological factors that underpin psychological well-being;
methods of carbohydrate loading and training tapering strategies;
the structure and function of the kidneys.

- Consult the online curriculum centre (OCC) frequently for teacher support materials

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