Government of **Western Australia**
School Curriculum and Standards Authority

Summary report of the 2022 ATAR course examination report:
Human Biology

Year	Number who sat	Number of absentees
2022	3791	73
2021	4216	78
2020	4380	64
2019	4475	50

The number of candidates sitting and the number attempting each section of the examination can differ as a result of non-attempts across sections of the examination.

Examination score distribution–Written
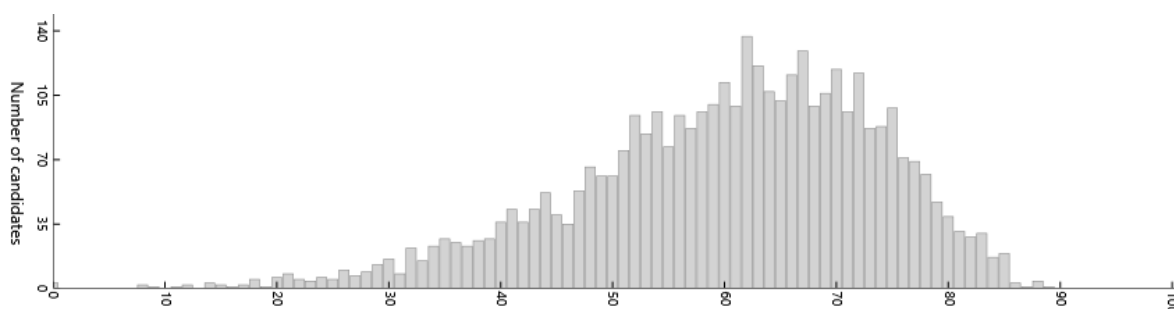
Summary

The examination paper discriminated well between students. The examination was an appropriate length with most candidates attempting all questions. The overall mean of 60.06% was comparable with the 2021 mean of 61.26%.

Attempted by 3791 candidates   Mean 60.06%   Max 89.43%   Min 0.00%

Section means were:
Section One: Multiple-choice   Mean 76.45%
Attempted by 3791 candidates   Mean 22.93(/30)   Max 30.00   Min 0.00
Section Two: Short answer   Mean 56.55%
Attempted by 3783 candidates   Mean 28.27(/50)   Max 44.70   Min 0.00
Section Three: Extended answer Unit 3   Mean 49.25%
Attempted by 3736 candidates   Mean 4.92(/10)   Max 10.00   Min 0.00
Section Three: Extended answer Unit 4   Mean 39.25%
Attempted by 3717 candidates   Mean 3.93(/10)   Max 9.25   Min 0.00

General comments

The candidates were able to demonstrate a thorough knowledge of the syllabus throughout the examination. Section One: Multiple-choice was particularly strong with very few questions proving to be a challenge to the majority of candidates. In both Sections Two and Three, most candidates could recall basic facts, but only some candidates could effectively answer the in-depth analysis questions.

Advice for candidates
- The examination is based on the syllabus and not a textbook. You should expect a comprehensive coverage of the syllabus content in the examination. Although the same

syllabus points may appear in recent examinations, questions will be structured in new and different contexts.

- You must read questions carefully to ensure you understand the meaning of verbs used in the question. You need to know the difference between a question requiring you to 'name' or 'identify' compared to one requiring you to 'describe' or 'explain'. Refer to the *Glossary of key words used in the formulation of questions,* which is available online through the course page.
- You are encouraged to attempt every question. You should always try to put something down as an answer, even if it is an educated guess. A non-attempted question means no marks can be achieved.
- You need to focus on interpreting the question and providing a succinct answer, rather than simply writing down all you have learnt on the topic. Simply stating key terminology or a rote learnt response will often not address the entire question. Instead, you need to apply your knowledge to the specific question.
- The most thorough and complete responses in the Extended answer section of the paper are produced by those who complete a plan. Take time to plan your response and ensure all parts of the question are addressed.
- You are encouraged to present annotated diagrams, charts, or tables to construct responses to questions in the Short and Extended answer sections. This technique is particularly important in the Extended answer section to help you write clear and precise answers and ensure that markers can easily follow and award marks for responses.

Advice for teachers
- Students require a detailed knowledge of all syllabus content and the ability to apply the content to new and different contexts. Simple recall and rote learning of facts are not enough for candidates to gain full marks in the examination. Encourage students to be able to think critically and apply their knowledge to unique scenarios.
- There were several specific syllabus points that were not answered well in this examination. Teachers should be aware of these areas and design appropriate teaching strategies around them. These include:
  - application of the knowledge of index fossils to explain a scenario
  - role of bacterial enzymes in DNA sequencing
  - role of transgenic organisms in recombinant DNA technology
  - application of the knowledge of blood glucose regulation to explain a scenario
  - random genetic drift
  - links between bipedalism, cranial capacity, and tool use in hominin evolution
  - distinct features of the *Homo neanderthalensis* skull.
- Teachers are reminded that a textbook is not the syllabus. Supplementary teaching is necessary and learning with other references and resource materials may be required.
- Examination techniques should be modelled and reinforced throughout the year during classroom lessons and assessments. Students need to be given ample practise at decoding extended response questions as part of their lessons and school-based assessment program. They need substantial practise in breaking down a question and identifying the question components.
- Mathematical skills are a required element in the syllabus. Provide students ample practise at applying all required mathematical skills in a scientific method context.

Comments on specific sections and questions
Some questions in Section One were answered very successfully and demonstrated outstanding factual recall of specific syllabus content such as those associated with polymerase chain reaction (PCR), relative dating methods and the role of antibodies. Section Two questions relating to the scientific method syllabus content were completed the most competently. The questions on Unit 3 content were generally completed more successfully than those on Unit 4. For the Unit 3 Extended answers, Question 37 on the brain was the

most effectively answered with a mean of 50.15%, while Question 38 on disease transmission and vaccination had a slightly lower mean of 48.45%. The Unit 4 Extended answer section was the most demanding section of the examination with the lowest overall mean of the four sections. The mean score for Question 39 was 36.28% considerably lower than Question 40 at 43.72%.

Section One: Multiple-choice (30 Marks)

This section had an overall mean of 76.45%. Generally, questions were well answered with only Questions 23, 26 and 29 having mean scores at or below 60%. Questions 3, 4, 5, 6, 8, 9, 11, 13, 18, 19 and 30 all had mean scores above 85%. Candidates performed well on straightforward recall style questions and found the more complex, multi-step questions challenging.

Section Two: Short answer (99 Marks)

This section had an overall mean of 56.55% which was almost identical to the mean in the same section in 2021. Questions 31, 32, 34 and 35 all had mean scores above 55%. Question 34 focused on the application of scientific method skills and was the most successfully completed question in this section. Questions 31, 32 and 35 all had very similar mean scores. Question 36 on the evidence for evolution, natural selection and random genetic drift was the most challenging question of Section Two. Throughout this section, candidates were able to demonstrate a good recall of basic facts and knowledge. The higher order and application type questions were successful in differentiating candidates and provided an opportunity for candidates to demonstrate their understanding of course content. The most difficult questions for the candidates throughout the section were those that required application of theory to explain a new scenario.

Section Three: Extended answer Unit 3 (20 Marks)

This section had an overall mean of 49.25%. Question 37 was the most successfully answered question with a mean of 50.15%, while Question 38 achieved a mean of 48.45%. Generally, candidates who attempted questions using annotated diagrams and tables were able to construct more precise and understandable responses.

Section Three: Extended answer Unit 4 (20 Marks)

This section had an overall mean of 39.25%. Question 39 was the least successfully answered question with a mean of 36.28%, while Question 40 had a considerably better mean of 43.72%. Generally, candidates who attempted questions using annotated diagrams and tables were able to construct more precise and understandable responses.