



## Course Report 2018

Subject	Human Biology
Level	Higher

This report provides information on the performance of candidates. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published assessment documents and marking instructions.

The statistics used in this report have been compiled before the completion of any Post Results Services.

# **Section 1: comments on the assessment**

## **Summary of the course assessment**

### **Component 1 — question paper**

Section 1 (objective test) performed as expected.

Section 2 was slightly more challenging than expected this year.

Candidates were generally good at demonstrating their knowledge. However, their responses to straightforward knowledge questions in a few areas were disappointing. In addition, a noticeable number of candidates had difficulty correctly phrasing their answers to 'describe' and 'explain' questions. The majority of candidates demonstrated good numeracy and analytical skills. Some questions proved slightly more demanding than originally intended. This was taken into account when setting the grade boundaries.

### **Component 2 — assignment**

Candidates continue to do well in the assignment.

The analysis, conclusion and evaluation sections were the most challenging sections for candidates.

## Section 2: comments on candidate performance

### Areas in which candidates performed well

#### Component 1 — question paper

##### Section 1

Questions 1, 2, 6, 7, 9, 15, 16, 17, 19	Most candidates demonstrated that they had knowledge and understanding of the topics covered by these questions.
Questions 4, 5, 13	Most candidates were able to apply their knowledge and understanding to answer these questions correctly.
Questions 11 and 18	Most candidates showed the skills required to answer these questions correctly.

##### Section 2

Most candidates demonstrated good knowledge and skills in the following areas:

Questions 1(a)(i), (b)(i), (b)(iii)	Stating where glycolysis occurs, naming NADH and indicating that lack of oxygen was the reason muscle cells produce lactic acid.
Questions 2(a), (c)(i)	Identifying variables that should be kept constant in an investigation and constructing a line graph.
Questions 3(a), (c)	Identifying that the mutation was a deletion, calculating a ratio, and drawing a conclusion about how the number of olfactory genes affects the sense of smell of animals.
Questions 4(a)(iii), (iv), (b)(i)	Predicting from a trend in a graph, selecting evidence from a graph, and calculating how many times a number is increased.
Questions 5(a)	Identifying the parts of the brain and heart shown in the diagram.
Questions 6(a), (b)(ii)	Calculating the greatest percentage increase in the table and selecting a year from the table.
Question 7(a)(i)	Calculating BMI.
Questions 9(a)(i), (b), (c)(i), (c)(ii)	Explaining how size aids distance judgement, knowing the term 'binocular disparity', calculating the missing figure using an average, and evaluating the design of the investigation.
Question 10(d)	Calculating a total using a given percentage.
Questions 11(a)(ii), (b)(ii)	Stating a disease pattern is endemic and explaining why it is difficult to immunise 100% of a population.
Questions 12(a)(i), (b)	Naming epithelial cells, naming histamine, and explaining how histamine increases fluid supply to infected tissue.

## Component 2 — assignment

- Section 1 Nearly all candidates produced an appropriate aim for their investigation.
- Section 2 Many candidates showed excellent knowledge and understanding of the biology underlying their investigation.
- Section 3 Most candidates selected two pieces of relevant data.
- Section 4 The majority of candidates processed and presented their raw data.
- Section 8 Most candidates produced a structured report that had an appropriate title and contained references at the end.

## Areas which candidates found demanding

### Component 1 — question paper

#### Section 1

- Question 3 This was designed to be a challenging question. Candidates had to know that blood was a connective tissue and then calculate that 20% of cells were dividing.
- Question 8 Approximately half the candidates worked out the sequence in which the listed substances were produced during respiration.
- Question 10 Approximately half the candidates correctly predicted the changes in compounds Q and R.
- Question 12 This was a novel question, designed to be challenging. Candidates had to use all the information provided to select the number of affected individuals in the family tree.
- Question 14 Approximately half the candidates applied their knowledge to the diagram showing the movement of substances between the blood and liver tissue cells.
- Question 20 This was a challenging question. A large number of candidates failed to spot that the *y*-axes' scales were different and, therefore, chose option B rather than option C.

#### Section 2

- Question 1(a)(i) Many candidates stated that ATP molecules are 'invested'. Using the word that has to be described in its description is not an acceptable response.
- Question 1(b)(ii) A large number of candidates did not realise that NAD allows glycolysis/ATP production to continue.
- Question 2(b) Many candidates knew that a non-competitive inhibitor binds to the enzyme at a site that is not the active site. However, they failed to say that this changes the shape of the active site.
- Question 2(c)(ii) Many candidates discussed the relationship between inhibitor concentration and final alcohol concentration instead of inhibitor concentration and enzyme activity.

Question 2(d)	Only a small number of candidates realised that the final alcohol concentration would not change if a non-competitive inhibitor was used.
Question 3(a)(ii)	Many candidates did not know that changing the sequence of bases would change the order of amino acids in the resultant protein.
Question 3(b)	Only some candidates knew that the term was 'systematics'.
Question 3(d)	Candidates answered this question poorly. Many candidates described gene mutations instead of chromosome structure mutations. In addition, few candidates indicated that these mutations could be fatal to the individual.
Question 4(a)(i)	Only some candidates correctly read this graph with its two vertical axes. A large number of candidates thought that the answer was 4 per 100 000 .
Question 4(b)(ii)	Over half the candidates were unable to apply their knowledge and suggest a reason for bottle-fed babies having a higher chance of intestinal infection.
Question 5(b)	Many candidates gained 1 mark for explaining how the sympathetic nervous system speeds up heart rate and the parasympathetic system slows it down. However, few were able to gain the second mark for correctly discussing the roles of noradrenaline and acetylcholine.
Question 5(c)(i)	The majority of candidates did not read the ECG correctly and calculate the heart rate.
Question 5(c)(ii)	Only some candidates realised that ventricular systole occurred between points Q and S.
Question 6(b)(i)	Many candidates did not know that statins are drugs used to control cholesterol levels.
Question 6(c)	Only some candidates correctly described a role of cholesterol in the body. Many thought that cholesterol supplied energy to the body.
Question 7(a)(ii)	Many candidates did not provide a comparison between the office worker and the swimmer.
Question 7(b)	Many candidates gave general answers about insulin being ineffective, rather than focussing on cell receptors.
Question 8(a)(i)	Many candidates did not realise that process X was encoding.
Question 8(a)(ii)	Just over half the candidates did not realise that items are lost from short-term memory by displacement, as it has a limited capacity.
Question 8(a)(iii)	A number of candidates did not describe 'organisation' or 'elaboration', they simply wrote down these terms. Many other

	candidates described chunking, which keeps information in short-term memory and does not aid transfer to long-term memory.
Question 8(a)(iv)	Few candidates indicated that contextual cues relate to when the memory was first formed.
Question 8(b)	Over half the candidates were unaware that semantic memories are stored in the cerebrum.
Question 9(a)(ii)	Only some candidates knew what superimposition meant.
Question 9(c)(iii)	Many candidates did not link their conclusion to the aim of the experiment, judgement of distance.
Question 10(a)(i)	A number of candidates did not describe the full trend for males, only indicating that the percentage of male smokers decreased from 25–34 years.
Question 10(a)(ii)	Many candidates did not indicate that it was older smokers who would have died.
Question 10(b)(i)	A large number of candidates gave a general description of an agonist rather than relating their answer to acetylcholine.
Question 10(b)(iii)	Many candidates did not mention receptors in their answer.
Question 10(c)	Many candidates' answers were very general and did not mention identification.
Question 11(a)(i)	A large number of candidates stated what an epidemic was, but did not relate their answers to the graph.
Question 11(a)(iii)	Many candidates thought that 'sporadic' meant that there would be fewer cases rather than that the cases would occur irregularly.
Question 11(b)(i)	Many candidates said that there would be less chance of unimmunised individuals coming into contact with the disease rather than infected individuals.
Question 12(a)(ii)	Only some candidates were aware that epithelial cells produce secretions.
Question 12(c)(i)	Many candidates stated that phagocytes engulf and destroy pathogens. However, they needed to indicate that phagocytes digest pathogens. Many candidates stated that NK cells induce apoptosis of the pathogen rather than the infected cell.
Question 12(c)(ii)	Only some candidates were aware that phagocytes and NK cells produce cytokines.
Question 13(b)	Many candidates did not have the detailed knowledge required about infertility treatments.

## **Component 2 — assignment**

Again, this year, the following sections proved to be the most challenging for candidates.

- Section 5      Almost half the candidates failed to achieve any marks for the analysis section. This was because they did not conduct a full analysis of their data. Many failed to describe the key trends and relationships shown and did not quote relevant figures to support their analysis.
- Section 6      Many candidates did not gain the conclusion mark because their conclusion either did not address their aim, or was unsupported by the data in their report.
- Section 7      Few candidates gained 3 marks for their evaluation. Many candidates did not use the terms 'valid', 'reliable' and 'robust' correctly.

## Section 3: advice for the preparation of future candidates

The mandatory course content for Higher Human Biology has been reviewed and some areas of content have been removed. Teachers and lecturers must ensure that they are using the revised [Higher Human Biology Course Specification](#) for session 2018–19 onwards.

### Component 1 — question paper

From session 2018–19 there will be two question papers. Question paper 1 will contain 25 multiple-choice questions and question paper 2 will contain restricted-response and extended-response questions worth 95 marks. A specimen question paper will be published on the Human Biology page of SQA's website in due course.

Candidates should be prepared to answer questions that ask them to demonstrate and apply the mandatory knowledge from the course. The mandatory knowledge is outlined in the course specification. The course support notes (appendix 1 of the course specification) provide further detail on the depth of knowledge required for each key area of the course. The key areas **and** the depth of knowledge **can be assessed in the question paper**.

Many candidates performed exceptionally well. A number of the questions that candidates found demanding were designed to be more challenging and, as expected, fewer candidates answered these correctly.

Candidates' understanding of some areas of basic mandatory knowledge was lacking, including: systematics, chromosome structure mutations, the role of cholesterol, Type 2 diabetes, encoding, superimposition, desensitisation, secretion production by epithelial cells, and production of cytokines. Teachers and lecturers should ensure all the course content is covered with all candidates.

Candidates performed well in skills-based questions. However, they continue to have difficulty taking readings from graphs containing two vertical axes. Many candidates also need to work on fully describing trends and relationships shown in graphs and tables.

Some candidates showed poor literacy skills. A number of candidates had great difficulty correctly phrasing their answers to questions where they had to describe or explain. Teachers and lecturers could encourage candidates to identify key terms in questions and to read questions thoroughly so they fully understand what they are being asked.

### Component 2 — assignment

Changes have been made to the structure of the Higher Human Biology assignment for session 2018–19. Teachers and lecturers must ensure that they are using the most up-to-date version of the [Higher Human Biology coursework assessment task](#). The document includes instructions for candidates, which teachers and lecturers must issue to candidates at the outset. Candidates are required to carry out a practical experiment to generate data to use in the report stage of their assignment.



The Understanding Standards website contains examples of candidate evidence, with accompanying commentaries, to help teachers and lecturers develop an understanding of the standards required for assessment.

## Grade boundary and statistical information:

### Statistical information: update on courses

Number of resulted entries in 2017	5927
Number of resulted entries in 2018	5937

### Statistical information: performance of candidates

#### Distribution of course awards including grade boundaries

Distribution of course awards	Percentage	Cumulative %	Number of candidates	Lowest mark
Maximum mark				
A	23.4%	23.4%	1387	81
B	23.6%	47.0%	1401	68
C	22.9%	69.8%	1357	56
D	11.2%	81.0%	662	50
No award	19.0%	-	1130	-

## **General commentary on grade boundaries**

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as arrangements evolve and change.

SQA aims to set examinations and create marking instructions which allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary).

It is very challenging to get the standard on target every year, in every subject at every level.

Therefore, SQA holds a grade boundary meeting every year for each subject at each level to bring together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

- ◆ The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.
- ◆ The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.
- ◆ Where standards are comparable to previous years, similar grade boundaries are maintained.

Grade boundaries from exam papers in the same subject at the same level tend to be marginally different year to year. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set by centres. If SQA alters a boundary, this does not mean that centres should necessarily alter their boundary in the corresponding practise exam paper.