

Assessment Report

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Level 2 Biology 2021

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Part A: Commentary

Successful candidates wrote concise, accurate and clear answers. They used appropriate biological language. Most responded to all questions in each booklet and attempted to answer each bullet point within a question. They did not rewrite resource material but used the material to make links between biological ideas.

Part B: Report on standards

91156: Demonstrate understanding of life processes at the cellular level

Examination

The examination included three questions of which candidates were required to respond to all three. Questions 1-3 required candidates to apply their



understanding of life process at the cellular level. The questions covered the requirements of the 2021 assessment specification which included photosynthesis, respiration and mechanisms of cellular transport.

Observations

Candidates did not differentiate comprehensively between anaerobic and aerobic respiration in their answers. Some candidates demonstrated poor understanding of the context, which limited achievement. Most candidates showed a poor understanding of movement of solvents/solutes across a semi-permeable membrane and the purpose it served.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- showed a clear understanding of key terms and definitions
- described (or defined) key biological terms and ideas for photosynthesis, aerobic and anaerobic respiration
- provided descriptions that showed understanding of the example/case studies.

Candidates whose work was assessed as **Not Achieved** commonly:

- provided descriptions that were incomplete or inaccurate
- did not attempt all question parts in the examination paper
- did not understand the example/case studies
- repeated information presented in the question.

Candidates who were awarded **Achievement with Merit** commonly:

- showed greater understanding of a concept by linking accurate descriptions to how or why a biological process occurred
- answered most or all parts of the questions, but did not link their answers to the context or stem of the question
- wrote clear and concise definitions and systematically addressed each bullet point

- provided in-depth understanding of respiration, photosynthesis and cellular transport mechanisms
- explained the light dependent phase and factors that affect the production of oxygen
- explained respiration, where it occurs and the advantages and disadvantages within the context of the question
- explained cell transport, why the blue cod drinks sea water and actively removes ions/large particles from its body.

Candidates who were awarded **Achievement with Excellence** commonly:

- provided thorough comprehensive discussion of key biological concepts in each question by making correct links between multiple concepts
 - communicated effectively by writing thorough concise and correct answers that linked structure to function in the context provided
 - comprehensively discussed photosynthesis, the light dependent phase and factors that affect the production of oxygen
 - comprehensively discussed respiration, where it occurs and the advantages and disadvantages within the context of the question
 - comprehensively discussed cell transport, why the blue cod drinks sea water and actively removes ions/large particles from its body.
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91157: Demonstrate understanding of genetic variation and change

Examination

The examination included three questions relating to the biological principles relating to genetic variation, which covered the requirements of the 2021 assessment specifications.

Candidates were required to apply their understanding of sources of variation within individual(s)/gene pool, biological process influencing allele frequencies in populations (natural selection, migration and genetic drift).

Observations

Generally, the quality of writing inhibited candidates from expressing their answers fluidly. Many candidates were explaining natural selection in terms of the alleles being more suited to the environment instead of the individual's phenotype. Many candidates were not using the term 'homologous chromosomes' when explaining independent assortment and crossing over.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- completed a dihybrid Punnett square and determined phenotype ratios
- showed understanding of crossing over, genetic drift effect, founder effect and natural selection
- could describe key biological terms e.g. alleles (not genes), homologous pairs of chromosomes, independent assortment, crossing over.

Candidates whose work was assessed as **Not Achieved** commonly:

- provided incorrect descriptions of key ideas
- could not accurately complete a dihybrid Punnett square / pedigree chart
- did not include key ideas in descriptions e.g. homologous, random effect of genetic drift
- confused genetic drift and natural selection
- incorrectly wrote one or two genotypes in the Punnett square.

Candidates who were awarded **Achieved with Merit** commonly:

- wrote in-depth biological reasons by explaining how or why a given concept worked using resource material
- clearly explained the process of natural selection
- explained phenotype and genotype ratios from Punnett squares

- clearly explained in-depth the processes of independent assortment and crossing over
- were able to link some of their correct biological ideas to the context of the question
- complemented descriptions with appropriate examples.

Candidates who were awarded **Achievement with Excellence** commonly:

- comprehensively and clearly discussed biological ideas by integrating reasons in context
 - supported their answers with resource material given in the question.
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91159: Demonstrate understanding of gene expression

Examination

The examination included three questions relating to the biological principles relating to gene expression covered by the 2021 assessment specifications. Candidates were required to respond to all three questions and apply their understanding of the nature and structure of DNA, protein synthesis and factors influencing/affecting metabolic pathways.

Observations

Explanations of how the base-pairing rule is achieved was often poorly understood by candidates. Many answers lacked the number of hydrogen bonds, or single vs double-ring ideas. Explanations of the function of the coding and template strands were often poorly attempted by candidates or missed completely.

Grade awarding

Candidates who were awarded **Achievement** commonly:

- defined biological concepts correctly
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- described the differences in structure between DNA and mRNA
- read/used the codon table correctly
- described the process of transcription
- gave clear basic definitions and descriptions of transcription and metabolic pathways
- described how mutations impacted protein function
- identified how a person could simultaneously have both PKU and albinism based on the metabolic pathway given.

Candidates whose work was assessed as **Not Achieved** commonly:

- did not define biological concepts correctly
- could not use/read the codon table correctly
- could not identify the types of mutations that occurred in the scenario given
- confused the function of the enzyme which synthesised mRNA with mRNA itself, stating that mRNA made mRNA during transcription
- were unable to describe key biological concepts
- confused the function of a gene and the function of an enzyme in relation to metabolic pathways
- gave vague over-simplistic examples of mutagens eg “radiation” or “chemicals”.

Candidates who were awarded Achievement with Merit commonly:

- explained biological concepts in relation to a context correctly
- made some links between biological concepts while attempting all bullet points
- explained the relationship between genes, enzymes and products in relation to a metabolic pathway
- explained the underlying reasons behind the differences seen in DNA and mRNA.
- explained the process of transcription

- recognised and explained the separate functions of the coding and template strands in DNA
- explained complementary base pairing in relation to hydrogen bonds, rings or base size
- related the change in the base sequence (substitution) to the effect on the amino acid sequence, and consequently protein shape and, therefore, its function overall
- showed an understanding of how degeneracy due to redundancy of the code was responsible for different codons coding for the same amino acid
- explained the relationship between genes, enzymes and products in a metabolic pathway
- explained how it was possible for someone to simultaneously have both PKU and albinism
- explained how the change in location of a mutation impacted what products were formed
- gave logical reasons why removing protein from a person's diet could prevent PKU.

Candidates who were awarded **Achievement with Excellence** commonly:

- wrote comprehensive answers that included clear and accurate explanations of key concepts in context
- comprehensively explained the function of the DNA coding and template strands, and mRNA in relation to accurate transcription, polypeptide chain sequence, protein shape and function
- comprehensively explained the process of transcription and how accurate transcription was achieved due to the structure of the nucleotides enabling complementary base pairing
- compared and contrasted the effects of silent and non-silent substitution mutations on both mRNA, amino acids, and protein structure
- comprehensively explained the relationship between genes, enzymes and all products in relation to this metabolic pathway, linking this to how someone could simultaneously have both PKU and albinism

- showed a clear understanding of all aspects of metabolic pathway given, including the specific effects of different mutations as well as environmental changes had on this specific metabolic pathway.

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Previous years' reports

[2020 \(PDF, 194KB\)](#)

[2019 \(PDF, 146KB\)](#)

[2018 \(PDF, 128KB\)](#)

[2017 \(PDF, 50KB\)](#)