

# Assessment Report

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### Part A: Commentary

Successful candidates tended to write concise, accurate and clear answers. They used biological language appropriate at level 7 of the curriculum. 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.

Candidates who gained Achievement demonstrated understanding of key words and biological ideas in the questions.

Candidates gaining Merit demonstrated in-depth understanding by explaining how and why biological ideas were linked together.

Candidates gaining Excellence demonstrated comprehensive understanding of biological ideas by integrating resource material correctly to further justify and evaluate their answers.

## Part B: Report on standards

### 91156: Demonstrate understanding of life processes at the cellular level

Candidates who were awarded **Achievement** commonly:

- showed a clear understanding of key terms and wrote succinct definitions at level 7 of the curriculum
- described (or defined) key biological terms and ideas for photosynthesis, cell respiration, enzymes, mitosis.

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

- provided descriptions that were below level 7 of the New Zealand curriculum
- provided descriptions that were incomplete or inaccurate
- repeated information presented in the question
- did not attempt all question parts in the examination paper
- confused biological concepts such as photosynthesis and respiration
- confused the terms such as cell membrane / cell wall and turgid / flaccid
- stated chloroplasts were on top of leaves
- described the process of DNA replication (in steps) rather than the purpose
- provided evidence when not asked to by the question
- showed poor understanding of enzymes and inhibitors.

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 enzymes.

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
- provided answers that linked back to the stem of the question and incorporated the given context in each question
- communicated effectively by writing thorough concise and correct answers that linked structure to function in the context provided
- comprehensively discussed enzymes and how inhibitors/cyanide had a negative effect on the different stages of cell respiration
- identified and discussed how chloroplast location affect the light dependent processes e.g. access to light, carbon dioxide
- comprehensively discussed how cell growth and division keeps SA:V efficient, the cell is able to move nutrients and waste quickly to allow cell to function.

### Standard specific comments

Some candidates demonstrated poor reading of the question which limited achievement e.g. students linked their answers to the whole plant rather than to the cell.

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## 91157: Demonstrate understanding of genetic variation and change

Candidates who were awarded **Achievement** commonly:

- completed a dihybrid Punnett square / pedigree chart and determined phenotype ratios
- showed understanding of crossing over, genetic drift effect, population bottleneck and natural selection
- attempted to answer all bullet points of each question
- could describe key biological terms e.g. alleles (not genes), homologous pairs of chromosomes, independent assortment, segregation

- could not give a reason for the biological ideas they described
- could annotate diagrams accurately for processes occurring during meiosis.

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

- gave descriptions that were below level 7 of the New Zealand Curriculum
- left many question parts unanswered
- provided incorrect descriptions of key ideas of the standard
- could not accurately complete a dihybrid Punnett square / pedigree chart
- did not include key ideas in descriptions e.g. *homologous*, *randomeffect* 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 and linked it to the context
- explained phenotype and genotype ratios from Punnett squares in Q3 in relation to co-dominance and recessive inheritance
- clearly explained in-depth the processes of independent assortment and segregation in Q1
- were able to explain why the process led to consequences such as increase/decrease in variation, success of a population / lack of genetic diversity
- were able to link some of their correct biological ideas to the context of the question
- complemented descriptions with appropriate examples (even if not in the context provided), which gave a marker a better insight into the candidate's understanding of a biological concept.

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

- comprehensively and clearly discussed biological ideas by integrating reasons with the context or linking to the stem of the question
- supported their answers with resource material given in the question
- answered all parts of each question.

### Standard specific comments

Candidates often used genes and alleles interchangeably in their answers.

Some candidates provided very detailed answers for the stages of meiosis which is not a requirement of the standard, rather than applying it to the context of a source of variation.

Some candidates' answers showed a lack of understanding of how to comprehensively discuss biological concepts and ideas and apply to the context of the question.

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## 91159: Demonstrate understanding of gene expression

Candidates who were awarded **Achievement** commonly:

- provided answers to each of the bullet points in each question
- attempted all questions in the booklet
- gave clear basic descriptions of transcription and translation in relation to protein synthesis
- read and used the codon table correctly
- described how mutation could impact protein function
- correctly described biological terms such as mutation, metabolic pathway, mRNA, tRNA, ribosome, DNA and mRNA

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

- provided descriptions that were below level 7 of the New Zealand Curriculum
- failed to complete all questions

- were unable to describe key biological concepts, transcription, translation and metabolic pathways
- repeated the question without adding any of their own information or provided information not relevant to the question
- confused the function of a gene and the function of an enzyme in relation to metabolic pathways
- confused the function of the enzyme which synthesised mRNA with mRNA itself, stating that mRNA made mRNA during transcription.

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 process of transcription and translation
- made links to the change in the base sequence (deletion) to the effect on the amino acid sequence and consequently protein shape and therefore its function overall
- explained the implication of frameshifts changing the location of the stop codon in relation to polypeptide chain length
- showed an understanding of how degeneracy due to redundancy of the code was responsible for different codons coding for the same amino acid
- gave logical reasons why both transcription and translation were needed, rather than just restating what happens in each process
- explained how mutations resulted in non-functional (rather than absent) enzymes in a metabolic pathway
- explained how the change in location of a mutation impacted what products were formed.

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

- wrote comprehensive answers that included clear and accurate explanations of key concepts which were linked to the stem of the question

- used the given contexts to fully explain their ideas
- distinguished clearly between the effects of frameshift and non-frameshift mutations on both mRNA and protein structure, folding and shape including the impact of a premature or late stop codon
- gave comprehensive reasons why transcription and translation were needed for protein synthesis, rather than just restating what happens in each process
- compared and contrasted the process of transcription and translation, discussing the similarities and differences seen
- linked the mutation to the change the enzyme structure and subsequent non function in the metabolic pathway
- showed clear understanding of a mutation at the start / end of a metabolic pathway and its effects on both Tyrosine and Phenylalanine production.

## [Biology subject page](#)

### Previous years' reports

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

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

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