2015 NCEA Assessment Report

Biology   Level 2   91156, 91157, 91159

Part A: Commentary

Comment on the overall response of candidates to 2015 examinations for all achievement standards covered by this report.

Successful candidates wrote clear, concise and accurate answers, using appropriate biological language at Level 7 of the Curriculum. They attempted to answer all of the questions in each booklet and all bullet points within a question. They did not rewrite resource material already provided in the question.

Candidates gaining Achievement, Merit, or Excellence correctly responded to the key words in the questions and addressed all bullet points. Many candidates made links between the biological ideas or concepts that related to the question and the specific standard. They drew clear diagrams and provided concise annotations which added depth and detail to their responses. They also referred to resource material to further illustrate their understanding.

Many candidates limited their level of achievement by providing responses that were not linked to the question or the specific standard. Their responses were below Level 7 of the New Zealand Curriculum. These candidates did not attempt all of the questions within each paper and failed to complete diagrams or tables.

Part B: Report on standards

1.   Assessment Report for 91156: Demonstrate an understanding of life processes at the cellular level

Achieved	Candidates who were assessed as Achieved commonly:
	• showed a clear understanding of key terms • provided accurately labelled diagrams where relevant • showed understanding of organelles and their functions • provided word equations where appropriate • attempted to address most or all of the bullet points in each question.
Not Achieved	Candidates who were assessed as Not Achieved commonly:
	• provided descriptions that were below Level 7 of the curriculum • provided definitions that were incomplete or inaccurate • provided responses that simply repeated information presented in the question • provided information relevant to the process but not the question • did not understand the significance of cadmium as an inhibitor • confused the processes of respiration and photosynthesis.
Achieved with Merit	Candidates who were assessed as Achieved with Merit commonly:
	• showed greater understanding of a concept with expansive and accurate definitions that flowed into explanations • explained the processes of rate of respiration • showed understanding of the contexts presented and how these relate to the concepts in this standard • provided detailed explanations for more than one of the required ideas as prompted by the bullet points in the question.
Achieved with Excellence	Candidates who were assessed as Achieved with Excellence commonly:
	• provided thorough explanations for key ideas in each question • made clear links between specific definitions and or explanations as part of their discussion • provided evidence that consistently linked back to the main question and relevant to the contexts • provided comprehensive evidence, making links between the process and the

	biology involved.

2. Assessment Report for 91157: Demonstrate understanding of genetic variation and change

Achieved	Candidates who were assessed as Achieved commonly:
	• showed understanding of key terms such as gene pool, somatic mutation, allele frequency
	• attempted most bullet points in all questions
	• correctly constructed a simple punnet square.
Not Achieved	Candidates who were assessed as Not Achieved commonly:
	• provided descriptions that were below Level 7 of the New Zealand Curriculum
	• described Black Robins' thoughts and feelings rather than selection pressure and natural selection
	• re-stated information supplied rather than using this information in their responses
	• left many questions unanswered
	• provided incorrect definitions for basic descriptions
	• digressed in several answers with information from another standard.
Achieved with Merit	Candidates who were assessed as Achieved with Merit commonly:
	• provided accurate definitions and then elaborated with detail, for example defined genetic drift with further information on the impact gene loss has on a small population
	• referred to both parent allele contributions to the offspring rather than just the final genotype of the offspring e.g. Q2b and Q2c
	• understood that AB blood type involves two separate proteins in a single cell not 50% type A and 50% type B blood in any individual
	• were able to explain a test cross.
Achieved with Excellence	Candidates who were assessed as Achieved with Excellence commonly:
	• comprehensively discussed comprehensively the relationship between selection pressure and natural selection
	• used resource material to elaborate on the explanation of a concept, for example used rim laying failure as an example of natural selection.
	• clearly linked selection pressure to offspring survival
	• referred to both sides of the case e.g. the favourability of nest-laying allele AND the unfavourability of the rim-laying allele while discussing natural selection
	• discussed biological concept in the context of the question
	• were able to discuss parental gametes in Q 2 b and could describe
	• why alleles were needed from both parents for Type O blood and Type AB in Q2c
	• thoroughly explained the full test cross including lethal allele cross
	• comprehensively discussed how the heterozygous individuals for the Cystic Fibrosis allele were unaffected but were carriers for the disease and used the punnet square to indicate that there was 25% chance of producing a homozygous lethal offspring.
Standard specific comments	Some candidates were not able to distinguish between selection pressure and natural selection.
	Many candidates were not able to describe the difference between dominance and co-dominance therefore did not show understanding that AB blood group had both A and B phenotype
	Many candidates confused genotype and phenotype.

3. Assessment Report for 91159: Demonstrate understanding of gene expression

Achieved	Candidates who were assessed as Achieved commonly:
	• accurately described some key concepts but were confused with the big ideas, for

	example many knew mutation and metabolic pathway in question 2 but did not see that the gene carried a code for the synthesis of the protein • showed understanding that cuttings had identical alleles • were able to link lower temperature with reduced growth • wrote answers in a logical sequence • used the bullet points provided in the question to scaffold their answers.
Not Achieved	Candidates who were assessed as Not Achieved commonly: • provided description below Level 7 of the Curriculum • wrote irrelevant information • failed to complete the questions • drew a mirror image of a complementary DNA strand • did not draw diagrams in question 1 to support their understanding of the interactions between triplets, codons and anticodons • failed to include the information given in the diagram about changes in temperature at different elevations • lacked basic biological knowledge for this standard.
Achieved with Merit	Candidates who were assessed as Achieved with Merit commonly: • explained biological concepts in relation to the context • linked enzymes to transcription and ribosomes to translation • explained that enzymes are affected by temperature • were able to explain the importance of complementary base pairing in ensuring accuracy in transcription • used clear labelled diagrams of transcription and translation • understood that a gene coded for a protein, and that enzymes are proteins • were able to explain that a specific amino acid was linked to a specific anti codon • understood that genotype is the same for each of the three cuttings.
Achieved with Excellence	Candidates who were assessed as Achieved with Excellence commonly: • answered all parts of the questions linking L2 biology (from this topic) to the context • thoroughly explained the complementary relationship between triplet, codon, anticodon • fully explained the effect of every mutation on the pathway • knew that enzymes are globular proteins • linked the mutation with a change in the structure of the enzyme which affects it binding to the substrate • were able to draw the anti-parallel DNA strand • explained the temporary binding of tRNA to the ribosome • linked changing temperatures to enzyme activity • linked enzyme activity to production of proteins needed for growth/ mitosis/ photosynthesis / metabolic pathways • wrote answers in a logical sequence.
Standard specific comments	Many candidates confused DNA replication with protein synthesis. Many candidates incorrectly stated that the gene sent a message to the enzyme, or that the gene, if mutated would have the right shape to fit the enzyme