

National Certificate of Educational Achievement

2011 Assessment Report

Biology Level 3

- 90715 Describe the role of DNA in relation to gene expression**
- 90716 Describe animal behaviour and plant responses in relation to environmental factors**
- 90717 Describe processes and patterns of evolution**
- 90719 Describe trends in human evolution**

COMMENTARY

Several candidates wrote responses that were relevant and showed depth of understanding by linking biological ideas and displaying their knowledge, adding to and expanding on the resources given. Many candidates wrote much more than would fit in the spaces provided, adding little or no value to their answers. As a consequence, a number of candidate scripts had evidence of rushing. Answers were often scrawled and lacked in considered explanations.

Those who focused on the intent of the question and planned their responses, using the scaffolding provided, frequently produced answers that showed clear understanding of the biological ideas and the ability to link key concepts, avoiding unnecessary content.

STANDARD REPORTS

90715 Describe the role of DNA in relation to gene expression

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- showed basic understanding of processes involving replication and protein synthesis
- recognised the difference between DNA replication and protein synthesis
- were able to identify the enzymes involved in DNA replication
- attempted all questions but not necessarily all sections.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- did not recognize key concepts relating to genetics
- confused the role of RNA in transcription and translation
- did not describe key enzymes e.g. gyrase was confused with helicase
- did not answer all questions and wrote very little overall
- did not use resource material adequately
- restated information given in the question or presented contradictory information.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- included appropriate and clearly labelled diagrams to help demonstrate their understanding
- gave detailed, in-depth answers for two of the three questions.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- understood the overall concept of DNA replication and protein synthesis

- explained the role of DNA in enzyme failure and the consequences this has on the cell/organism
- linked ideas relating to DNA sequence with formation of the final amino acid/protein structure
- related ideas about linked genes to independent assortment, crossing over and the formation of recombinants.

OTHER COMMENTS

The concepts of linked genes, crossing over, independent assortment, and recombinants were not well understood.

90716 Describe animal behaviour and plant responses in relation to environmental factors

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- showed an understanding of key biological terms
- interpreted graphs and diagrams accurately
- expressed their answers with suitable clarity.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- did not complete all questions
- did not adequately address the question that was asked
- produced repetitive answers that lacked both accuracy and detail
- used incorrect terminology.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- wrote full answers with accurate explanations
- used correct biological terms
- used resource material to relate to and support their explanations.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- demonstrated a high level of biological literacy
- linked explanations to produce answers that showed a high level of understanding of biological ideas

- could compare and contrast factors and responses for plant orientation and animal behaviour.

OTHER COMMENTS

Candidates who did not attempt all questions in this paper were disadvantaged. A knowledge of both plant and animal responses is required.

90717 Describe processes and patterns of evolution

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- were able to describe patterns, rates, and processes
- correctly identified processes and patterns of evolution
- interpreted a phylogeny and used the information to explain patterns of evolution
- applied their understanding of key concepts such as natural selection and speciation to their responses.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- did not complete all questions in the paper
- did not distinguish between population and species
- did not describe a pattern of evolution in any detail
- did not link the process of speciation with the events leading up to it
- showed no understanding of the role of geographical isolation in separating populations.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- addressed questions logically and used the scaffolding provided
- identified punctuated equilibrium and explained it with reference to a significant change in the environment
- linked the spread of Nestor with a reason, and identified selection pressures as a factor
- showed understanding of the role of genetics in the evolutionary process
- understood the concept of different selection pressures and applied it correctly.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- discussed selection pressures and their effect on adaptations

- discussed ecological divergence of one species and contrasted it with a lack of divergence in another species
- understood clearly how isolation, selection pressures, and reproductive isolating mechanisms work together in evolutionary processes
- discussed how geographical isolation can lead to a change in the environment over time, which alters the selection pressures on populations and leads to the development of new phenotypes and speciation
- applied in-depth knowledge accurately to new situations.

OTHER COMMENTS

It is important that candidates attempt all questions and that answers relate to the question that has been asked. Candidates should ensure that terminology used frequently in this topic is learned and used correctly.

90719 Describe trends in human evolution

ACHIEVEMENT

Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They typically:

- stated skeletal characteristics associated with bipedalism and arboreal life
- defined key ideas such as cultural evolution and Out of Africa theory
- related their own knowledge to resource material provided
- used some key biological terms correctly e.g. foramen magnum, valgus angle, brachiation
- defined basic characteristics of tool cultures
- interpreted the question correctly and stayed within its parameters.

NOT ACHIEVED

Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They typically:

- restated the information provided in the question
- gave pre-written answers rather than responding to the question asked
- displayed poor understanding of different tool cultures and of different dispersal theories
- did not describe key concepts or consequences e.g. of domestication
- wrote general, vague answers without using scientific evidence or correct biological terms.

ACHIEVEMENT WITH MERIT

In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit typically:

- explained the positive and negative significance of the skeletal features
- showed a clear understanding of modern human dispersal using mtDNA evidence
- linked domestication with subsequent benefits and disadvantages of sedentary life

- used key terms accurately and gave appropriate scientific evidence to support their answers.

ACHIEVEMENT WITH EXCELLENCE

In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence typically:

- communicated ideas clearly and made significant links between relevant biological concepts
- compared and contrasted information with respect to bipedalism, domestication, and dispersal theories
- answered all questions, using scientific evidence to write concise, well-constructed responses
- demonstrated evidence of planning in clearly expressed and integrated responses.

OTHER COMMENTS

Many candidates showed a poor understanding of the timeline for human evolution. This made it difficult for them to demonstrate understanding of evolutionary change. It is important that key terms and fundamental ideas are well understood.