

AS90713 (Biology 3.1)

The changes have been made to this achievement standard to align it with those made at Level 1 and Level 2. These changes are reflected in the changes to the title, introductory statement, and criteria.

- *Title*
The title now reads as 'Carry out a practical investigation into an aspect of an organism's ecological niche with guidance'.
- *Credit value*
The credit value has been reduced from 5 credits to 4 credits as a result of reviewing the distribution of credits across all of the Level 3 achievement standards in this domain and in relation to the learning time involved for Biology 3.1.
- *Criteria*
Criteria have been changed to align with the changes made to AS90457, Biology 2.1. The second criterion (in relation to the report) has been retained to reflect the importance of a formalised report at this level, and to show the progression from Level 2 to Level 3.
- *Explanatory notes*
Explanatory Note 3 has been altered to emphasise that the aspect of the ecological niche may relate to biotic and/or abiotic factors. This is to reflect more clearly the intent of the curriculum document.
Explanatory Note 6 identifies characteristics of a practical biological investigation. In the third bullet point the phrase 'qualitative or quantitative' has been added after data to clarify that students should collect, record and process the appropriate data for the investigation.
Explanatory Note 7 states the characteristics of a 'quality practical biological investigation'.
Explanatory Notes 8, 9 and 10 relate to the second criterion on reporting and specify what is required to clearly differentiate between the achievement grades.
Statistical procedures are linked to a discussion of the validity of the investigation and are required as part of a comprehensive discussion at achievement with excellence. Statistics do not establish reliability of data, but do establish reliability of conclusions drawn from that data. Concern that students would use tests inappropriately led to the replacement of 'ANOVA and Chi-squared tests' with 'other appropriate test'.

AS90714 (Biology 3.2)

- *Explanatory notes*
A new Explanatory Note 5 has been added to define what is meant by referenced information.
Explanatory Note 6 has definitions of the key terms and the definition of 'evaluate' has been amended to more clearly define what is required for achievement with excellence.

AS90715 (Biology 3.3)

- *Title*
The title has been altered to read 'Describe the role of DNA in relation to gene expression' to clarify and emphasise the intent of Biology 3.3.
- *Criteria*
These have been amended to reflect the change in title.
- *Explanatory notes*

The notes have been revised and reorganised (Explanatory Notes 2-6) to clarify the content required and to emphasise that this achievement standard is about the role of DNA in the determination of phenotype.

'Gene-environment interactions' has been deleted because the focus is on the role of DNA. The confusion that was apparent in the assessment of Biology 3.3 should be avoided with the removal of this term.

'Collaboration' has been added to 'gene-gene interactions' because it is not an epistatic relationship.

AS90716 (Biology 3.4)

- *Title*

The title has been amended to read as 'Describe animal behaviour and plant responses in relation to environmental factors', to clarify the intent of Biology 3.4.

- *Criteria*

No changes have been made to the criteria although some feedback from the consultation suggested that the two criteria for achievement with merit and achievement with excellence should be combined into one criterion. The reason for keeping separate criteria for each of these two grades of achievement is that while the first criterion requires description of both animal behaviour and plant responses, the second criterion requires the students to explain/discuss either animal behaviour or plant responses.

- *Explanatory notes*

Explanatory Note 2 has been slightly amended to emphasise the focus on behaviour and responses.

A new explanatory note (Explanatory Note 3) has been added to clarify what is required for achievement with merit and achievement with excellence in terms of the relationship of environmental factors to behaviour/response.

AS90717 (Biology 3.5)

- *Title*

The title has been amended to read as 'Describe processes and patterns of evolution' to clarify the intent of Biology 3.5.

- *Credit value*

Credit value has been increased from 2 credits to 3 credits to better reflect the learning time this topic requires.

- *Criteria*

These have been changed to reflect the changed title and more clearly define that the difference between the achievement grades is related to the quality of the explanation/discussion of the patterns of evolution.

- *Explanatory notes*

The version 1 Explanatory Note 2 has been split into two explanatory notes (Explanatory Note 2 and Explanatory Note 3) to clarify the distinction between patterns and processes. 'Speciation' has been removed as a separate bullet point because it is inherent in the remaining points. 'The role of natural selection' has been added to this explanatory note.

The new explanatory note, Explanatory Note 3, contains two new terms: 'co-evolution' and 'gradualism'. 'Co-evolution' reflects our increasing knowledge of how two taxa can evolve in concert. 'Gradualism' balances 'punctuated evolution'.

AS90718 (Biology 3.6)

- *Mode of assessment*

The mode of assessment has been changed from external to internal assessment.

This change is to address a number of issues from the feedback as a result of consultation while still retaining both AS90714, Biology 3.2 and AS90718, Biology 3.6 as separate achievement standards. These issues included:

- Concerns about the difficulty for students entered in all five externally assessed achievement standards to demonstrate their achievement given the constraints of a three hour examination time frame.
- The rapidly changing nature of this topic.
- That the practical work was an important aspect of this topic and this would be lost if the topic became part of a research-type achievement standard.
- The wish to retain a breadth of treatment, by studying more than one application and technique that was all that would have been required in the combined achievement standard.

A change from external to internal assessment allows for a more flexible approach to the assessment of this achievement standard. The balance of credits between internal and external assessment is now 10:14 and should allow students more time to demonstrate their achievement in all four achievement standards in a three hour examination.

- *Explanatory notes*

Explanatory Note 2 has been amended to emphasise that the techniques are to be relevant to the application. 'DNA chips' has been added to the list of techniques.

Explanatory Note 3 has been amended by the addition of 'stem cell research' and 'xenotransplantation'.

AS90719 (Biology 3.7)

- *Title*

The title has been amended to read 'Describe trends in human evolution'.

The trends are defined in the explanatory notes to include 'biological and cultural evolution' and the 'patterns of dispersal'.

- *Criteria*

Changes to the criteria reflect the changes to the title and to strengthen the focus on the trends.

- *Explanatory notes*

Explanatory Note 2 has been changed to clarify the meaning of 'trend' for this achievement standard and emphasise the material to be covered by separating human biological and cultural evolution, and including patterns of dispersal of hominins. The use of 'hominin' restricts discussion to events on human lineage. The term 'hominin' has been defined.

Explanatory Note 3 and 4 clarify the trends to be described/explained/discussed.

Explanatory Note 7 has been amended to more clearly define the distinction between achievement with merit and achievement with excellence.

Impact on Accreditation and Moderation Action Plan (AMAP)

None.

Impact on existing qualifications

None.

Impact of changes on NCEA Exclusions List

None.

Summary of main changes to achievement standards' Ids, classification, titles, levels, and credits

The following summary shows the changes made to the achievement standards as a result of the review. All changes are in **bold**.

Key to review category	
A	Dates changed, but no other changes are made - the new version of the standard carries the same Id and a new version number
B	Changes made, but the overall outcome remains the same - the new version of the standard carries the same Id and a new version number
C	Major changes that necessitate the registration of a replacement achievement standard with a new Id
D	Achievement standard will expire and not be replaced

Subfield Science
Domain Biology

Id	Title	Level	Credit	Review Category
90713	Carry out an investigation into an aspect of the ecological niche of an organism with guidance Carry out a practical investigation into an aspect of an organism's ecological niche with guidance	3	5 4	B
90714	Research a contemporary biological issue	3	3	B
90715	Describe gene expression Describe the role of DNA in relation to gene expression	3	4	B
90716	Describe animal behaviour and plant responses Describe animal behaviour and plant responses in relation to environmental factors	3	4	B
90717	Describe patterns of evolution Describe processes and patterns of evolution	3	2 3	B
90718	Describe applications of biotechnological techniques	3	3	B
90719	Describe trends in human biological and cultural evolution Describe trends in human evolution	3	3	B