

Achievement Standard

Subject Reference	Biology 3.5		
Title	Demonstrate understanding of evolutionary processes leading to speciation		
Level	3	Credits	4
		Assessment	External
Subfield	Science		
Domain	Biology		
Status	Registered	Status date	4 December 2012
Planned review date	31 December 2019	Date version published	17 November 2016

This achievement standard involves demonstrating understanding of evolutionary processes leading to speciation.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of evolutionary processes leading to speciation. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of evolutionary processes leading to speciation. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of evolutionary processes leading to speciation.

Explanatory Notes

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 8 within the Science learning area. It is aligned with the achievement objectives in the following two strands:
 Living World strand:
 - Life processes, ecology, and evolution, 'Explore the evolutionary processes that have resulted in the diversity of life on Earth and appreciate the place and impact of humans within these processes'
 Nature of Science strand:
 - Understanding about science, 'Understand that scientists have an obligation to connect their new ideas to current and historical scientific knowledge and to present their findings for peer review and debate'.

It is also related to the material in the *Teaching and Learning Guide for Biology*, Ministry of Education, 2010, at <http://seniorsecondary.tki.org.nz>.

This standard is also derived from *Te Marautanga o Aotearoa*. For details of *Te Marautanga o Aotearoa* achievement objectives to which this standard relates, see the [Papa Whakaako](#) for the relevant learning area.

- 2 *Demonstrate understanding* involves using biological ideas and/or scientific evidence to describe evolutionary processes leading to speciation.

Demonstrate in-depth understanding involves using biological ideas and/or scientific evidence to explain how or why evolutionary processes lead to speciation.

Demonstrate comprehensive understanding involves linking biological ideas and/or scientific evidence about evolutionary processes leading to speciation. The linking of ideas may involve justifying, relating, evaluating, comparing and contrasting, or analysing the evolutionary processes that lead to speciation.

- 3 *Evolutionary processes* involve the following biological ideas:
- role of mutation
 - gene flow
 - role of natural selection and genetic drift
 - modes of speciation (sympatric, allopatric)
 - reproductive isolating mechanisms that contribute to speciation (geographical, temporal, ecological, behavioural, structural barriers, polyploidy)
 - patterns such as divergence, convergence, adaptive radiation, co-evolution, punctuated equilibrium, and gradualism.
- 4 Scientific evidence for evolution, which may include examples from New Zealand's flora and fauna, will be selected from:
- fossil evidence
 - comparative anatomy (homologous and analogous structures)
 - molecular biology (proteins and DNA analysis)
 - biogeography.
- 5 Assessment Specifications for this achievement standard can be accessed through the Biology Resources page found at www.nzqa.govt.nz/ncea/resources.
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Replacement Information

This achievement standard replaced AS90717.

Quality Assurance

- 1 Providers and Industry Training Organisations must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.
- 2 Organisations with consent to assess and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference

0233