

Achievement Standard

Subject Reference	Biology 3.4		
Title	Demonstrate understanding of how an animal maintains a stable internal environment		
Level	3	Credits	3
		Assessment	Internal
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 how an animal maintains a stable internal environment.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of how an animal maintains a stable internal environment. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of how an animal maintains a stable internal environment. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of how an animal maintains a stable internal environment.

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 following achievement objective from the Living World strand:
 - Life processes, ecology, and evolution, 'Understand the relationship between organisms and their environment'.

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.

- Demonstrate understanding* involves using biological ideas to describe a control system by which an animal maintains a stable internal environment. Annotated diagrams or models may be used to support the description.

Demonstrate in-depth understanding involves using biological ideas to explain how or why an animal maintains a stable internal environment. This includes explaining how a specific disruption results in responses within a control system to re-establish a stable internal environment.

Demonstrate comprehensive understanding involves linking biological ideas about maintaining a stable internal environment in an animal. This includes at least one of:

- a discussion of the significance of the control system in terms of its adaptive advantage
- an explanation of the biochemical and/or biophysical processes underpinning the mechanism (such as equilibrium reactions, changes in membrane permeability, metabolic pathways)
- an analysis of a specific example of how external and/or internal environmental influences result in a breakdown of the control system.

3 A control system that maintains a stable internal environment (homeostatic system) refers to those that regulate:

- body temperature
- blood pressure
- osmotic balance
- level of blood glucose
- levels and balance of respiratory gases in tissues.

4 The biological ideas related to the control system includes the:

- purpose of the system
- components of the system
- mechanism of the system (how it responds to the normal range of environmental fluctuations, interaction and feedback mechanisms between parts of the system)
- potential effect of disruption to the system by internal or external influences.

5 Environmental influences that result in a breakdown of the control system may be external influences such as extreme environment conditions, disease or infection, drugs or toxins, or internal influences such as genetic conditions or metabolic disorders.

6 Conditions of Assessment related to this achievement standard can be found at <http://www.tki.org.nz/e/community/ncea/conditions-assessment.php>.

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