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	Approved	**Status date**	September 2024		
Planned review date	December 2028	**Date version published**	December 2024		

This achievement standard involves demonstrating understanding of how an animal maintains a stable internal environment.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
• Demonstrate understanding of how an animal maintains a stable internal environment.	• Demonstrate in-depth understanding of how an animal maintains a stable internal environment.	• Demonstrate comprehensive understanding of how an animal maintains a stable internal environment.

Explanatory Notes

1 This achievement standard is derived from Level 8 of the Science learning area in *The New Zealand Curriculum,* Learning Media, Ministry of Education, 2007.

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 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 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 adaptive significance of the control system
- a discussion 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 Schools and institutions must have been granted consent to assess by NZQA before they can register credits from assessment against achievement standards.

2 Schools and institutions with consent to assess must engage with the moderation system that applies to those achievement standards.

Consent and Moderation Requirements (CMR) reference 0233
