

Achievement Standard

Subject Reference	Earth and Space Science 3.4		
Title	Demonstrate understanding of processes in the ocean system		
Level	3	Credits	4
		Assessment	External
Subfield	Science		
Domain	Earth and Space Science		
Status	Registered	Status date	04 December 2012
Planned review date	31 December 2020	Date version published	17 November 2016

This achievement standard involves demonstrating understanding of processes in the ocean system.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of processes in the ocean system. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of processes in the ocean system. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of processes in the ocean system.

Explanatory Notes

This standard was re-published in November 2013 following a minor editorial change.

- This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 8, and is related to the material in the *Teaching and Learning Guide for Earth and Space Science*, Ministry of Education, 2010 at <http://seniorsecondary.tki.org.nz>. The standard is aligned to the Earth systems and Interacting systems achievement objective of the Planet Earth and Beyond strand.

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:
 - explaining processes and links within the processes in the ocean system.

Demonstrate in-depth understanding involves:

- explaining links between the processes in the ocean system.

Demonstrate comprehensive understanding involves:

- discussing the complexity of the ocean system.

3 *Processes in the ocean system* are selected from:

- ocean composition – gradients, temperature, density, salinity, pressure
- ocean circulation – surface and thermohaline circulations, Coriolis effect
- carbon cycle – carbonate chemistry, physical pumps, biological pumps
- transport of matter and energy – heat, tides, waves
- Southern Oscillation – El Niño and La Niña.

4 Assessment Specifications for this achievement standard can be found at <http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/>.

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