

Achievement Standard

Subject Reference	Science 1.14		
Title	Demonstrate understanding of carbon cycling		
Level	1	Credits	4
		Assessment	Internal
Subfield	Science		
Domain	Science - Core		
Status	Registered	Status date	30 November 2010
Planned review date	31 December 2019	Date version published	20 November 2014

This achievement standard involves demonstrating understanding of carbon cycling.

Achievement Criteria

Achievement	Achievement with Merit	Achievement with Excellence
<ul style="list-style-type: none"> Demonstrate understanding of carbon cycling. 	<ul style="list-style-type: none"> Demonstrate in-depth understanding of carbon cycling. 	<ul style="list-style-type: none"> Demonstrate comprehensive understanding of carbon cycling.

Explanatory Notes

- 1 This achievement standard is derived from *The New Zealand Curriculum*, Learning Media, Ministry of Education, 2007, Level 6. It is aligned with the Interacting Systems achievement objective in the Planet Earth and Beyond strand, and the Nature of Science strand, and is related to the material in the *Teaching and Learning Guide for Science*, 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](#).

- 2 *Demonstrate understanding* involves describing the addition, removal and storage of carbon using information, visual representations, and data.
- 3 *Demonstrate in-depth understanding* involves explaining the addition, removal and storage of carbon using information, visual representations, and data.
- 4 *Demonstrate comprehensive understanding* involves explaining thoroughly links between the addition, removal and storage of carbon using information, visual

representations, and data. It may involve elaborating, applying, justifying, relating, evaluating, comparing and contrasting, and analysing.

- 5 *Carbon cycling* includes the addition, removal and storage of carbon.

Addition means the release of carbon into the atmosphere as carbon dioxide and methane by:

- respiration, excretion, decay
- combustion eg the burning of fossil fuels
- volcanic activity.

Removal means removing carbon from the atmosphere by:

- photosynthesis eg by phytoplankton, forests
- dissolving in water eg in the surface of oceans.

Storage means holding carbon as:

- short-term storage eg by forests
- long-term storage by sediments, carbonate rocks (limestone), coal, oil, natural gas and subduction resulting in carbon-rich metamorphic and igneous rocks.

- 6 Conditions of Assessment related to this achievement standard can be found at <http://ncea.tki.org.nz/Resources-for-Internally-Assessed-Achievement-Standards>.
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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