

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 2016 **Date version published** 12 December 2013

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 www.tki.org.nz/e/community/ncea/conditions-assessment.php.

Quality Assurance

- 1 Providers and Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against achievement standards.
- 2 Accredited providers and Industry Training Organisations assessing against achievement standards must engage with the moderation system that applies to those achievement standards.

Accreditation and Moderation Action Plan (AMAP) reference

0233