

# **National Certificate of Educational Achievement**

## **2014 Assessment Report**

### **Earth and Space Science Level 3**

- 91413 Demonstrate understanding of processes in the ocean system**
- 91414 Demonstrate understanding of processes in the atmosphere system**

## COMMENTARY

Candidates who answered all the questions demonstrated an awareness of how the processes in the ocean and atmosphere systems impact our lives and how human actions impact on the Earth's systems. The standards were awarded to those candidates who related their answers to the context of the questions. Recalling general concepts is not sufficient to show understanding at NCEA L3.

Many candidates' annotated diagrams showed an understanding more clearly than their explanations; in some cases the diagram made an ambiguous written answer clear. This was expected hence the instruction in the examination for candidates to support their answers with annotated sketches or diagrams.

Some candidates did not show an understanding of the marking method, only attempting one of the three questions and making it unlikely they would present sufficient evidence to achieve the standard.

## STANDARD REPORTS

### 91413 Demonstrate understanding of processes in the ocean system

#### ACHIEVEMENT

**Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They commonly:**

- described winds and the Coriolis effect as contributors to circulation
- described both the short and long term storage of carbon in the ocean
- described a thermocline
- drew basic diagrams to show the consequence of an El Nino weather pattern on the ocean temperature.

#### NOT ACHIEVED

**Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They commonly:**

- explained thermohaline circulation as the main contributor to the ducks' motion around the ocean
- described phytoplankton and zooplankton turning into bacteria
- explained that the warm water is where fish like to live and cool water upwelling kills fish
- re-wrote information given in the question.

#### ACHIEVEMENT WITH MERIT

**In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit commonly:**

- described the ducks' movement as caused by surface currents formed due to the Coriolis effect and wind
- explained the short and long term storage of carbon in the biological pump
- linked the lack of upwelling and the effect on fishing.

## **ACHIEVEMENT WITH EXCELLENCE**

**In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence commonly:**

- explained the ducks' movement as caused by surface currents formed due to the Coriolis effect, which is due to the rotation of the Earth and deflects currents clockwise in the northern hemisphere and anticlockwise in the southern hemisphere
- explained the short and long term storage of carbon in the biological pump and related the phytoplankton numbers to an increase in carbon dioxide in the atmosphere
- linked the thermocline with the lack of upwelling and explained the effect on fishing.

## **OTHER COMMENTS**

Candidates should aim to use labelled diagrams to help explain their answers. Candidates frequently expressed themselves better in diagrams. In some cases, detailed, fully labelled diagrams were sufficient for Excellence.

## **91414 Demonstrate understanding of processes in the atmosphere system**

### **ACHIEVEMENT**

**Candidates who were awarded Achievement for this standard demonstrated the required skills and knowledge. They commonly:**

- knew some basic facts, but these were incorrectly presented
- wrote incorrect descriptions of the scientific phenomena
- produced ambiguous diagrams, e.g. it was not obvious to what some labels referred to and any ambiguity was not made clear in the written text.

### **NOT ACHIEVED**

**Candidates who were assessed as Not Achieved for this standard lacked some or all of the skills and knowledge required for the award of Achievement. They commonly:**

- knew some basic facts, but these were incorrectly presented
- wrote incorrect descriptions of the scientific phenomena
- produced ambiguous diagrams, e.g. it was not obvious to what some labels referred to, any ambiguity was not made clear in the written text.

### **ACHIEVEMENT WITH MERIT**

**In addition to the skills and knowledge required for the award of Achievement, candidates who were awarded Achievement with Merit commonly:**

- explained the links that were asked for in the question
- used annotated diagrams to explain the phenomena
- linked their written answer to their annotated diagram
- provided a structured answer
- correctly included information from beyond the question, for example explaining that the Ferrel cell contributed to showing some candidates knowledge of convective activity.

## **ACHIEVEMENT WITH EXCELLENCE**

**In addition to the skills and knowledge required for the award of Achievement with Merit, candidates who were awarded Achievement with Excellence commonly:**

- discussed in detail the science of the phenomena
- focused and tailored their answers to the questions with no extraneous information
- supported their written text with well annotated relevant diagram(s).

## **OTHER COMMENTS**

The Earth's atmospheric convection cells are three-dimensional phenomena. It was common to read about clockwise and anti-clockwise 'air mass' movement. This can lead to some confusion/ambiguity in the answer. This is an important consideration especially when referring to standard diagrams such as the one used in Question One.