



Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Level 1 Physics, Earth and Space Science 2025

92046 Demonstrate understanding of the effect on the Earth of interactions between the Sun and the Earth-Moon system

Credits: Five

SAMPLE ASSESSMENT

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the effect on the Earth of interactions between the Sun and the Earth-Moon system.	Explain the effect on the Earth of interactions between the Sun and the Earth-Moon system.	Analyse the effect on the Earth of interactions between the Sun and the Earth-Moon system.

This sample assessment contains one question. The actual assessment will contain three questions.

SAMPLE QUESTION

During the course of a year, the Earth experiences a range of temperatures as it moves throughout the seasons. However, not everywhere on the planet experiences the same number of seasons.

Discuss why the South Pole has a different number of seasons to Aotearoa New Zealand by answering the following questions.

SEASONS FOR THE SOUTHERN HEMISPHERE



Adapted from: <https://www.noaa.gov/media/cms-image/meteorological-and-astronomical-seasons-southern-hemisphere-graphic>

- (a) Use the image above to complete the table below.

Season length	Name of season
1 December – 28 February	
1 March – 31 May	
1 June – 31 August	
1 September – 30 November	

- (b) Describe the axial tilt and the time it takes for the Earth to orbit the Sun.

- (c) London is a city in the Northern Hemisphere at a latitude of 51.5°N , while Wellington is a city in Aotearoa New Zealand (Southern Hemisphere) at a latitude of 41.2°S . Both cities are within mid-latitudes, and experience four distinct seasons based on the amount of solar radiation they receive at different times of the year.

Discuss why these two locations experience seasons, but at opposite times of the year.

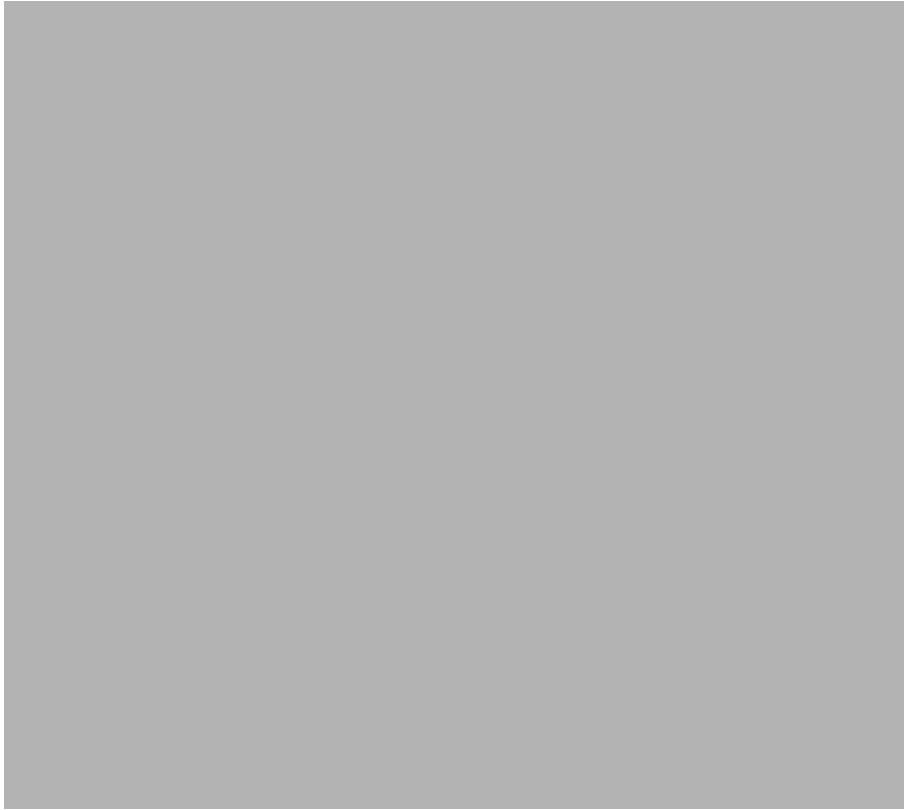
Your explanation should include:

- why both London and Wellington experience four seasons in a year
- how latitude affects the timing of these seasons.

You may use annotated diagrams to help explain your answer.



- (d) Aotearoa New Zealand scientists at the South Pole (latitude 90°S) experience six months of summer and six months of winter. This is very different to what they experience in Aotearoa New Zealand (latitude $34\text{--}47^{\circ}\text{S}$). Summer at the South Pole lasts from October to end of March, and winter lasts from start of April until end of September.



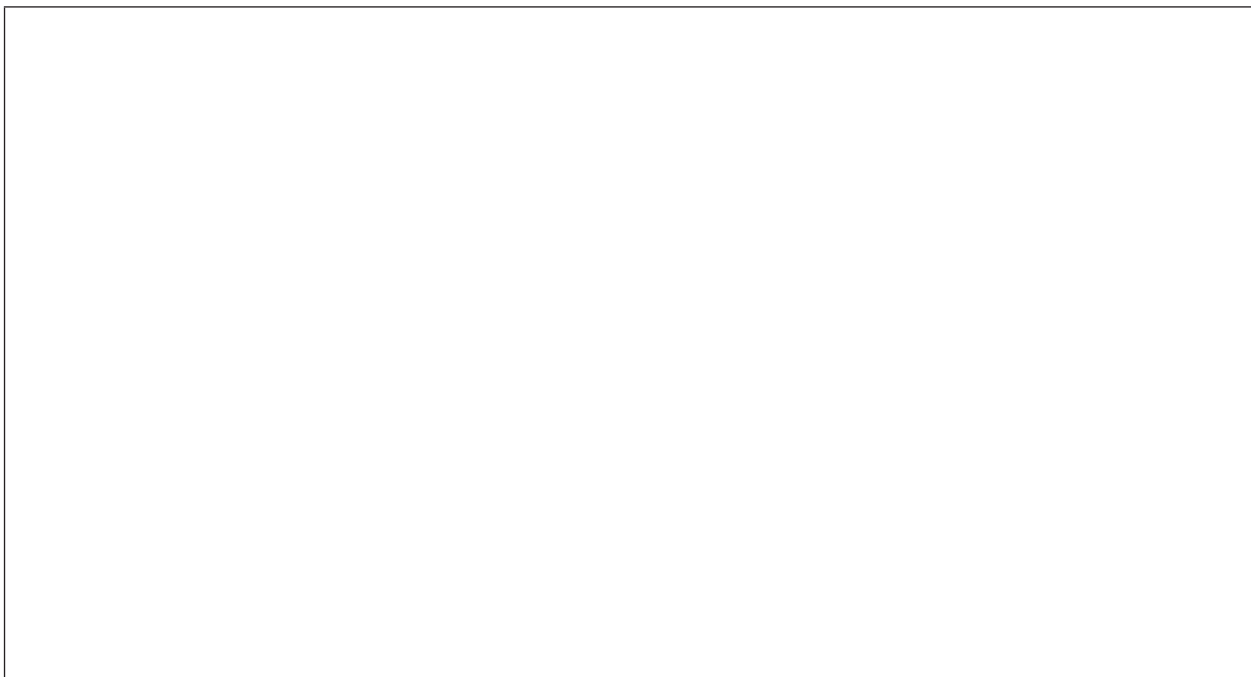
Adapted from: www.antarcticglaciers.org/antarctica-2/introductory-antarctic-resources/seasons-of-antarctica/

Discuss why the South Pole has only two distinct seasons, compared to the four seasons experienced in Aotearoa New Zealand.

Your discussion should include how:

- the axial tilt of the Earth affects the South Pole
- the Earth's orbit around the Sun
- the latitude of the South Pole and of Aotearoa New Zealand affects the number of seasons that each location experiences.

You may use annotated diagrams to help explain your answer.



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