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NZQA

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QUALIFY FOR THE FUTURE WORLD
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Level 3 Earth and Space Science, 2015

91414 Demonstrate understanding of processes in the atmosphere system

9.30 a.m. Tuesday 24 November 2015
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of processes in the atmosphere system.	Demonstrate in-depth understanding of processes in the atmosphere system.	Demonstrate comprehensive understanding of processes in the atmosphere system.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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QUESTION ONE: WIND BELTS

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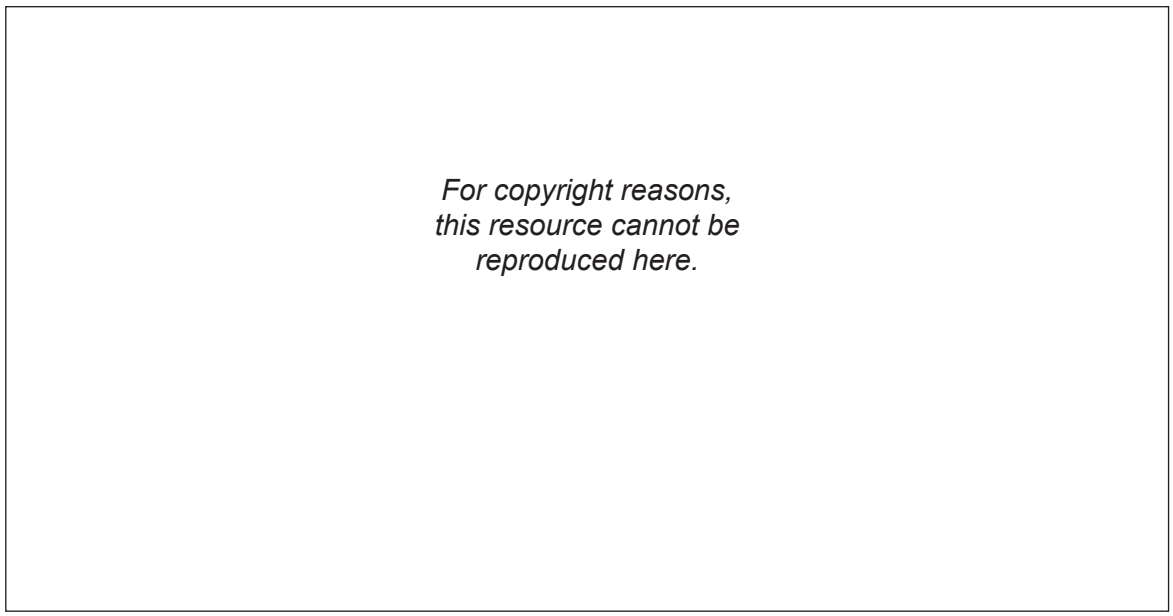
Two of the wind belts are the trade winds and the polar easterlies.



https://www.superteachertools.net/jeopardyx/uploads/20140611/prevailingwinds.jpg

Compare and contrast the processes involved in the formation of the trade winds and polar easterlies.

Your answer should include:

- an explanation of how temperature and pressure gradients cause winds
- an explanation of the Coriolis effect on trade winds and polar easterlies
- a discussion of the reasons for the similarities and differences in the formation of the trade winds and the polar easterlies.

A fully annotated diagram will help to support your answer.

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There is more space for your answer to this question on the following page.

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QUESTION TWO: CLIMATE CHANGE

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In spite of some year-to-year variability, there has been a gradual overall increase in global atmospheric temperatures (0.8°C) since 1880. 2014 was the warmest year during that period. The increased temperature is largely the result of increased carbon dioxide and water vapour. Scientists predict that global temperatures will continue to increase.

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http://earthobservatory.nasa.gov/Features/GlobalWarming/page2.php

Discuss how the increased amount of carbon dioxide and water vapour in the atmosphere will lead to the continuing increase in global temperatures.

Your answer should include:

- an explanation of how carbon dioxide increases global atmospheric temperatures
- an explanation of what causes the increase in water vapour
- a discussion of how increased water vapour increases global temperatures
- an explanation of how the increase in temperatures will affect climate trends.

Fully annotate the diagram on the following page to support your answer.

There is more space for your answer to this question on the following page.

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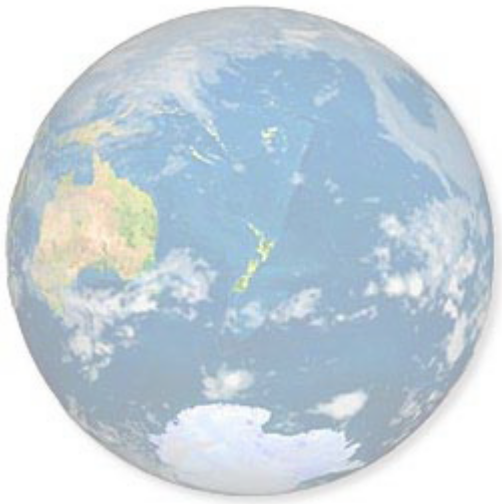

http://www.ew.govt.nz/PageFiles/623/climatechange1.jpg

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QUESTION THREE: CONVECTION CELLS AND THE GLOBAL DISTRIBUTION OF HEAT

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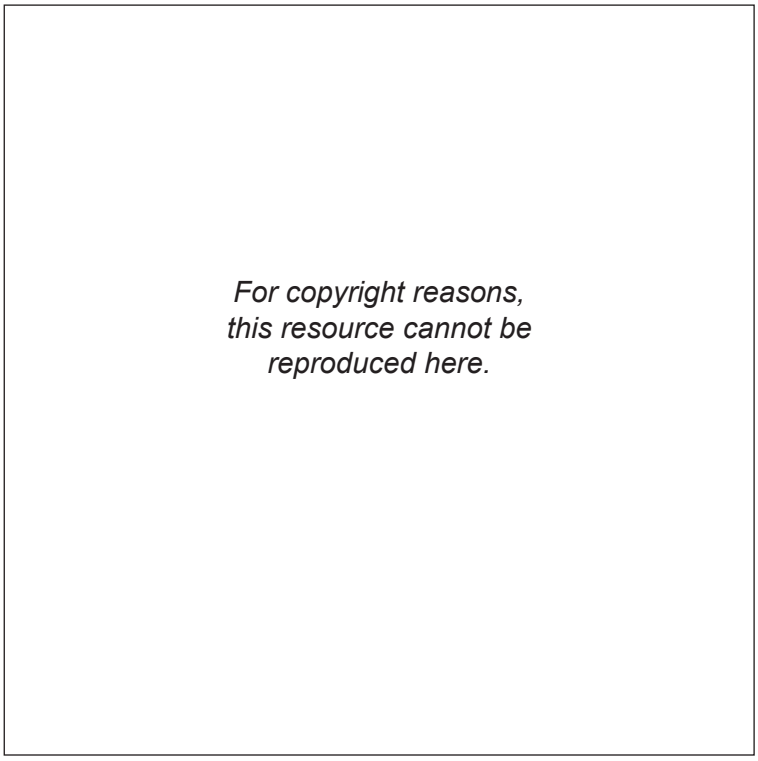
Polar and Hadley cells are closed convection loops. The Ferrel cell is a result of the other two cells interacting.



http://s.hswstatic.com/gif/weather-global-circulation.jpg

Describe the three atmospheric convection cells: Polar, Hadley and Ferrel, and explain how they interact to transport energy around the globe.

A fully annotated diagram will help to support your answer.

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There is more space for your answer to this question on the following page.

ASSESSOR'S USE ONLY

Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

ASSESSOR'S USE ONLY

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Write the question number(s) if applicable.

QUESTION NUMBER

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