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90461

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 2 Biology, 2003

90461 Describe concepts and processes relating to ecology

Credits: Two
2.00 pm Monday 17 November 2003

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 answer ALL the questions in this booklet.

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

Check that this booklet has pages 2–8 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.

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Achievement Criteria		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe biological concepts and processes relating to ecology. ☐	Explain biological concepts and processes relating to ecology. ☐	Discuss biological concepts and processes relating to ecology. ☐
Overall Level of Performance ☐		

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You are advised to spend 30 minutes answering the questions in this booklet.

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QUESTION ONE: Forest Organisms

Many different organisms live in a forest.

(a) The hoverfly is a type of fly found in beech forests. Over millions of years, it has adapted to mimic a bee, and so has the shape, colouration and behaviour of a bee.

Describe ONE advantage to the hoverfly of this adaptation.

The following photograph shows stratification of plants in a forest.

This picture could not be reproduced for copyright reasons

[Source: The Ancient Islands – New Zealand's Natural Environments, *Brian Enting and Les Molloy, Port Nicholson Press, 1982]*

(b) Explain the link between environmental conditions in a forest and the stratification of plants.

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Black orchid and fungus growing with mountain beech tree root

[Source: Adapted from http://www.rnzih.org.nz/pages/blackorchid.htm]

(c) Describe the interrelationships between the orchid, fungus and beech tree, and **discuss** how these interrelationships affect EACH of the three organisms.

QUESTION TWO: Marine Organisms

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The following diagram shows the zonation of animal and algae species on an underwater cliff at the Poor Knights Islands Marine Reserve, situated off the coast of Northland.

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[Adapted from: Marine Reserves for New Zealand, *W J Ballantine, University of Auckland, 1991]*

(a) The environmental conditions at the water surface and at 60 metres below the surface are not the same. In the table below:

(i) Give TWO environmental factors that are different at the water surface and at 60 m below the surface.

(ii) Describe EACH environmental factor at each depth.

	Depth (m)	(i) Environmental Factor	
		1.	2.
(ii) Description at each depth	Water surface, 0 m		
	60 m		

The following diagrams show the size of crayfish in populations inside and outside the Leigh Marine Reserve near Auckland.

This graph could not be reproduced for copyright reasons	**This graph could not be reproduced for copyright reasons**

[Source: Marine Reserves for New Zealand, *W J Ballantine, University of Auckland, 1991]*

The intra-specific competition between crayfish inside the reserve will differ from that between crayfish outside the reserve.

(b) Explain why the intra-specific competition is different in the two populations of crayfish.

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The graphs on page 5, showing the size of crayfish, give information about the current age structures of these two populations.

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(c) Discuss the impact that the age structure of each population is likely to have on **future** crayfish population numbers both **inside** and **outside** the Leigh Marine Reserve.

QUESTION THREE: A Pond Ecosystem

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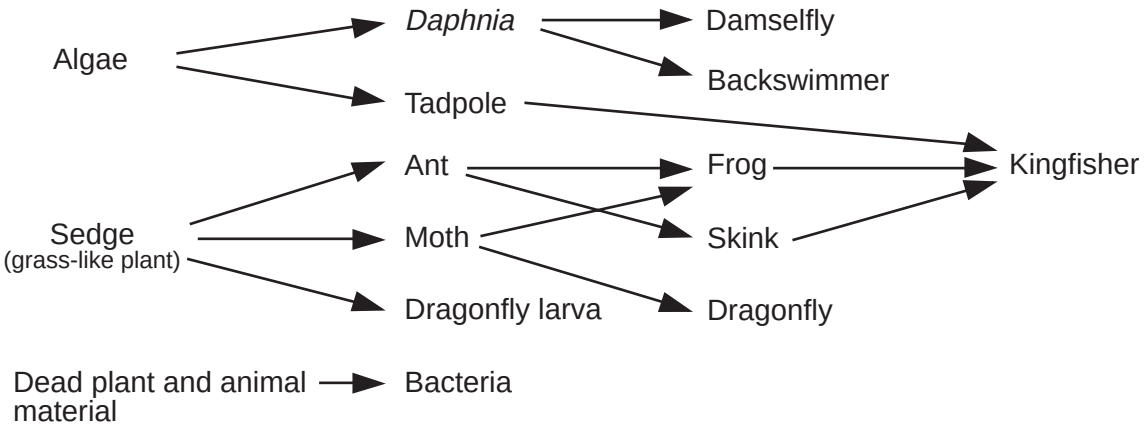
The diagram below shows a food web for some organisms in a pond ecosystem.



(a) Name the trophic levels the kingfisher occupies in the food web above.

(b) Explain the importance algae and sedge have in the flow of energy through this ecosystem.

Extra paper for continuation of answers if required.
Clearly number the question.

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Question Number