See back cover for an English translation of this cover

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91603M

916035

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

SUPERVISOR'S USE ONLY

Koiora, Kaupae 3, 2013

91603M Te whakaatu māramatanga ki ngā urupare a te tipu me te kararehe ki te taiao

2.00 i te ahiahi Rātū 12 Whiringa-ā-rangi 2013
Whiwhinga: Rima

Paetae	Paetae Kaiaka	Paetae Kairangi
Te whakaatu māramatanga ki ngā urupare a te tipu me te kararehe ki te taiao.	Te whakaatu māramatanga hōhonu ki ngā urupare a te tipu me te kararehe ki te taiao.	Te whakaatu māramatanga matawhānui ki ngā urupare a te tipu me te kararehe ki te taiao.

Tirohia mehemea e ōrite ana te Tau Ākonga ā-Motu (NSN) kei tō pepa whakauru ki te tau kei runga ake nei.

Me whakautu e koe te KATOA o ngā pātai kei roto i te pukapuka nei.

Ki te hiahia koe ki ētahi atu wāhi hei tuhituhi whakautu, whakamahia te (ngā) whārangi kei muri i te pukapuka nei, ka āta tohu ai i ngā tau pātai.

Tirohia mehemea kei roto nei ngā whārangi 2–15 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

© Mana Tohu Mātauranga o Aotearoa, 2013. Pūmau te mana.
Kia kaua rawa he wāhi o tēnei tuhinga e tāruatia ki te kore te whakaaetanga a te Mana Tohu Mātauranga o Aotearoa.

Kia 60 meneti hei whakautu i ngā pātai o tēnei pukapuka.

MĀ TE KAIMĀKA ANAKE

PĀTAI TUATAHI

E kitea whānuitia ana te manukau māhunga-parauri, *Molothrus ater*, i Te Hononga o Amerika. Ka whai ngā manukau i ngā kāhui kau e kai haere ana, e tino tawhiti ana te haere ia rā, me te kai haere i ngā ngāngara. E mōhiotia ana hei pirinoa kōhanga nā te whakawhānau i ā rātou hua ki ngā kōhanga o ētahi atu manu.

Whakawhānau ai i ngā manukau uwha i ā rātou hua takitahi ki ngā kōhanga o te kaihautū, ka whakarere mā ngā kātua whāngai hei tiaki. I te nuinga o te wā neke atu i te 40 ngā hua ka whakawhānauhia i ia wā tāuri. He tere ake te whānau me te tipu mai o ngā pīpī manukau i ngā pīpī ake a te kaihautū.

Ko te whakapae ko ngā manukau te pūtake o te mimiti haere o ngā manu waiata puta noa i Te Hononga o Amerika.

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

Ngā manukau whakaipoipo, uwha (mauī) me te taurawhi[1] (matau).

http://upload.wikimedia.org/wikipedia/commons/thumb/8/87/Cowbirdsincourtship.jpg/800px-Cowbirdsincourtship.jpg

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

He kōhanga nō te manu phoebe rāwhiti kei roto ko tētahi hua nā te manukau māhunga-parauri.

http://upload.wikimedia.org/wikipedia/commons/thumb/f/f9/Eastern_Phoebe-nest-Brown-headed-Cowbird-egg.jpg/800px-Eastern_Phoebe-nest-Brown-headed-Cowbird-egg.jpg

Matapakitia te whaikiko o te rautaki whakaputa uri a te manukau māhunga-parauri me te take e whai pānga ana ki te oranga o ngā manu waiata puta noa i Te Hononga o Amerika.

I tō whakautu me:

- whakaahua i te pirinoatanga me te painga urutau ka tukuna ki te manukau māhunga-parauri
- whakamārama i te take e mahi pai ai te rautaki whakaputa uri mō te manukau māhunga-parauri i roto i tōna pae rauropi[3].
- parahau i te take e whai wāhi ana ngā manukau māhunga-parauri ki te hekenga o ngā manu waiata puta noa i Te Hononga o Amerika.

[1] toa
[2] nohonga koiora

MĀ TE KAIMĀKA ANAKE

You are advised to spend 60 minutes answering the questions in this booklet.

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QUESTION ONE

The brown-headed cowbird, *Molothrus ater*, is found throughout the USA. Cowbirds follow herds of grazing animals, covering large distances daily, and feeding on insects. They are known as brood parasites because they lay their eggs in the nests of other birds.

Female cowbirds lay single eggs in host nests, abandoning them to the care of foster parents. On average up to 40 eggs are laid per breeding season. Cowbird chicks usually hatch sooner and grow faster than their hosts' chicks.

Cowbirds are believed to be a factor in the decline in numbers of songbirds across the USA.

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Courting cowbirds, female (left) and male (right).

http://upload.wikimedia.org/wikipedia/commons/thumb/8/87/Cowbirdsincourtship.jpg/800px-Cowbirdsincourtship.jpg

For copyright reasons, this resource cannot be reproduced here.

Eastern phoebe nest containing one egg from a brown-headed cowbird.

http://upload.wikimedia.org/wikipedia/commons/thumb/f/f9/Eastern_Phoebe-nest-Brown-headed-Cowbird-egg.jpg/800px-Eastern_Phoebe-nest-Brown-headed-Cowbird-egg.jpg

Discuss the effectiveness of the brown-headed cowbird's reproductive strategy and why it could be affecting the survival of songbirds across the USA.

In your answer you should:

- describe parasitism and the adaptive advantage it gives the brown-headed cowbird
- explain why the reproductive strategy works well for the brown-headed cowbird in its ecological niche
- justify why brown-headed cowbirds could be contributing to the decline of songbirds across the USA.

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MĀ TE KAIMĀKA ANAKE

PĀTAI TUARUA

Noho ai ngā kīrera rere i ngā rua hōhonu i ngā rākau, e kore ai e kitea e rātou mēnā he ao, he pō rānei a waho. He kararehe ohopō ēnei, ka ngangahau haere i waenga i te porehu me te ata pō[3].

I aroturukihia e ngā kairangahau ngā hohenga a ngā kīrera pāhoro mō ngā rā 23 i raro i ngā āhuatanga e rua: (a), he hurihanga auau o te 12 haora i te mārama, me te 12 haora i te pōuri, me (b), te pōuri tonu atu.

I whai wāhi ngā kīrera ki tētahi wīra korikori me tētahi paekati okioki. I tuhia aunoatia e tētahi pūhopu ina huri te wīra me te wā e noho noa iho ana.

E tohu ana ngā pae pōuri i ngā hoahoa-hohe e rua i raro i ngā mahi huri wīra.

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

Campbell N. A., Reece J. B., *2008*. *Biology*, putanga 7 (San Francisco: Pearson/Benjamin Cummings, 2008), wh. 1031.

Tātarihia ngā kitenga mai i ēnei hoahoa-hohe hei whakamārama he pēhea ngā urupare i runga e āwhina ai i te urutau o te kīrera rere ki tōna pae rauropi.

I tō whakautu me:

- whakaahua i ngā wā urupare, ūngeri rānei e whakaaturia ana e ngā hohenga a te kīrera i roto i ngā hoahoa-hohe e rua
- whakamārama he aha i rerekē ai ngā hoahoa-hohe e rua me tā ēnei e whakaatu ai mō te tauira i roto i te whanonga o te kīrera i roto i te 23 rā
- me whai whakaaro ki ngā painga urutau o tēnei whanonga ki te kīrera e pā ana ki tōna pae rauropi.

[3] pūao

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

QUESTION TWO

Flying squirrels nest in deep holes in trees, where they cannot see whether it is light or dark outside. They are nocturnal, becoming active between dusk and dawn.

Researchers monitored the activity of captured squirrels for 23 days under two sets of conditions: (a), a regular cycle of 12 hours of light and 12 hours of darkness, and (b), constant darkness.

The squirrels were given access to an exercise wheel and a rest cage. A recorder automatically noted when the wheel was rotating and when it was still.

The dark bars in the two actograms below indicate wheel-turning activity.

For copyright reasons, this resource cannot be reproduced here.

Campbell N. A., Reece J. B., *2008*. *Biology*, 7th ed. (San Francisco: Pearson/Benjamin Cummings, 2008), p 1031.

Analyse the findings from these actograms to explain how the responses shown above help the flying squirrel adapt to its ecological niche.

In your answer you should:

- describe the timing response or rhythm shown by the squirrel's activity in both actograms
- explain why the two sets of actograms are different and what they show about the pattern in the squirrel's behaviour over the twenty-three-day time period
- consider the adaptive advantages of this behaviour to the squirrel in relation to its ecological niche.

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MĀ TE KAIMĀKA ANAKE

PĀTAI TUATORU

Ina tinaku he kākano pīni, ka whakarite tētahi pahekotanga o ngā āhuatanga kia torotika te tipu o te pariri[4] ki runga, kia whakararo te tipu o te pakiaka, ahakoa pēhea te whakatō i te kākano.

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

Wāhanga tinaku o tētahi tipu pīni.

D. G. Mackean, *Life Study: A Textbook of Biology* (Rānana, John Murray, 1988)

Whakamāramahia te mahi a te tō ā-papa, te tūrama, me te taiaki whakatipu [auxin] i roto i te tipu o tētahi **pariri** mai i te tinakutanga ki tētahi tipu taute[5].

I tō whakautu me:

- whakaahua i te urupare o te pariri i roto i tōna taiao i a ia e tinaku ana ME te tipu haere tonu
- whakaahua i te mahi a te taiaki whakatipu i roto i te tipu pariri
- hono i ngā pānga o te tō ā-papa me te tūrama i roto i te hohenga a te taiaki whakatipu i ngā wāhanga rerekē o te tipu pariri tae atu ki te tautetanga.
- matapaki i ngā painga urutau ka riro i te pariri mai i ēnei urupare, i a ia ka pakari, e pā ana ki tōna pae rauropi.

[4] pihi
[5] kōkā

MĀ TE KAIMĀKA ANAKE

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QUESTION THREE

When a bean seed germinates, a combination of factors ensures that the shoot grows upwards and the root grows downwards, regardless of the way the seed has been planted.

For copyright reasons, this resource cannot be reproduced here.

Germination stages of a bean seedling.

D. G. Mackean, *Life Study: A Textbook of Biology* (London, John Murray, 1988)

Explain the roles of gravity, light, and auxin in the growth of a **shoot** from germination into a mature plant.

In your answer:

- describe the response of the shoot within its environment as it germinates AND as it continues to grow
- describe the role of auxin in shoot growth
- link the effects of gravity and light with the action of auxin through the different stages of shoot growth to maturity
- discuss any adaptive advantages the shoot gains from these responses, as it develops, in relation to its ecological niche.

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He puka anō mēnā ka hiahiatia.
Tuhia te (ngā) tau pātai mēnā e hāngai ana.

TAU PĀTAI

MĀ TE KAIMĀKA ANAKE

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

QUESTION NUMBER

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English translation of the wording on the front cover

Level 3 Biology, 2013

91603 Demonstrate understanding of the responses of plants and animals to their external environment

2.00 pm Tuesday 12 November 2013
Credits: Five

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the responses of plants and animals to their external environment.	Demonstrate in-depth understanding of the responses of plants and animals to their external environment.	Demonstrate comprehensive understanding of the responses of plants and animals to their external environment.

91603M

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 space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–15 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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