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91603M



916035



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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Tohua tēnei pouaka mēnā
KĀORE koe i tuhi kōrero ki
tēnei pukapuka

Mātai Koiora, Kaupae 3, 2022

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

Ngā whiwhinga: E rima

Paetae	Kaiaka	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 tōtōpū ki ngā urupare a te tipu me te kararehe ki te taiao.

Tirohia kia kitea ai e rite ana te Tau Ākonga ā-Motu (NSN) kei runga i tō puka whakauru ki te tau kei runga i tēnei whārangi.

Me whakamātau koe i ngā tūmahi KATOĀ kei roto i tēnei pukapuka.

Ki te hiahia wāhi atu anō koe mō ō tuhinga, whakamahia ngā whārangi wātea kei muri o tēnei pukapuka.

Tirohia kia kitea ai e tika ana te raupapatanga o ngā whārangi 2–15 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

Kaua e tuhi ki tētahi wāhi e kitea ai te kauruku whakahāngai (X). Ka poroa pea taua wāhanga ka mākahia ana te pukapuka.

HOATU TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

TE TŪMAHI TUATAHI: NGĀ HONONGA MOMO ŌRITE

He momo taketake te hihi (*Notiomystis cincta*). I ēnei rā ka kitea anake i ngā moutere me ngā takiwā tuawhenua i nekehia atu ai rātou, he konihi nā ētahi kararehe, pērā i te ngeru kāinga. He rerekē te pūnaha whakaputa hua a te hihi. Ko ētahi āhuatanga ka kitea, ko te whakaputa hua ā-tokorua me te **whakaputa hua ā-kāhui**.

Ka **ārai hoariri rātou i tētahi rohe i te kaupeka aihono** o te kōanga me te raumati, ā, he paparanga whakatopatopa ō rātou. He whaimana ake ngā kātua manu i ngā pīpī manu, mātua rā ngā manu e ōrite ana te ira. He whaimana ake ngā toa i ngā uwaha, hāunga i te wā kei te kōhanga ngā pīpī.

I te tīmatanga o te kaupeka whakaputa hua, ka kōrihirihi kia hoihoi tonu ngā toa tae noa atu ki te paunga o te kaupeka whakaputa hua. Ka rere whakamenomeno hoki rātou i te wāhi whakaputa, e kaha kitea ai te mā me te kōwhai o ngā huruhuru.



Te hihi toa

Te mātāpuna: <https://nzbirdsonline.org.nz/species/stitchbird>

Te hihi uwaha

Te mātāpuna: <https://nzbirdsonline.org.nz/species/stitchbird>

Matapakina te āhua o te mahi tahi a ngā whanonga o te hihi hei hāpai i te rahi o te taupori o tō rātou momo.

I tō tuhinga, me:

- whakaahua te kupu ‘paparanga’, te ‘konihi’, me te ‘rohe’
- whakamārama te āhua o te noho o te rautaki aihono, pērā i te kōrihirihi, i te rere whakamenomeno rānei hei huapai, hei huakino hoki ki te manu toa
- aromātai te āhua o te mahi tahi a ngā whanonga kua **tāmīratia** i runga ake nei (te whakaputa hua ā-kāhui me te ārai hoariri i tētahi rohe i te kaupeka aihono) ki te tiaki i te rahi o te taupori i ngā wāhi rauhi.

He wāhi anō mō tō
tuhinga mō tēnei tūmahi kei te
whārangi e whai ake nei.

TE TŪMAHI TUARUA: TE HEKENGĀ O TE INDIGO BUNTING

Te mātāpuna: <https://ebird.org/science/status-and-trends/indbun/range-map>

Te mātāpuna: www.flickr.com/photos/slingher/4522490194/

He manu rere tūārangi te indigo bunting (*Passerina cyanea*) i te wā o tana hekengā ā-tau. Ka heke i ngā pō anake. Kei te takiwā o te 2000 km te roa o te rere a te indigo bunting i ia whakawhitinga i waenganui i ngā wāhi whakaputa hua i te taha rāwhiti o Amerika ki te Raki (e whakaaturia ana ki te whereo), me ngā wāhi noho hōtoke mai i te taha taitonga o Florida ki te taha taitonga o Amerika Pū (e whakaaturia ana ki te kahurangi).

Matapakina te pāhekoheko o ngā whanonga i kōrerohia rā i runga ake nei hei tautoko, hei whakaū hoki i te oranga tonutanga o te momo.

I tō tuhinga, me:

- tautuhi te kupu 'hekengā'
- whakaahua te tauira koiora e whakaaturia ana, me whakaatu hoki te tohu ā-taiao koia pea e tohu ana kua tae ki te wā mō te hekengā
- whakamārama tētahi tikanga whakatare e tutuki ai te hekengā pō a te bunting
- matapaki te āhua o tā tēnei rerenga auau whakapūmau i te taupori o te indigo bunting, ahakoa ngā uauatanga o te rerenga roa.

He wāhi anō mō tō tuhinga
mō tēnei tūmahi kei ngā
whārangi e whai ake nei.

QUESTION TWO: MIGRATION OF INDIGO BUNTING

Source: <https://ebird.org/science/status-and-trends/indbun/range-map>

Source: www.flickr.com/photos/slingher/4522490194/

The indigo bunting (*Passerina cyanea*) is a bird that flies a long distance during its yearly migration, migrating only at night. Indigo buntings fly about 2000 km each way between breeding grounds in eastern North America (shown in red), and wintering areas from southern Florida to southern Central America (shown in blue).

Discuss how the behaviours mentioned above combine to help ensure the success of the species.

In your answer:

- define the term migration
- describe the biological rhythm shown, and give the likely environmental cue for migration
- explain a navigational method for the night migration of the bunting
- discuss how, despite the difficulties of a long journey, this repeated journey has enabled the indigo bunting population to be maintained.

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

TE TŪMAHI TUATORU: TE MĀWHAI



Te mātāpuna: https://upload.wikimedia.org/wikipedia/commons/4/42/Cuscuta_campestris_covering_host01.jpg

Te mātāpuna: <https://bygl.osu.edu/node/1682>

He tipu rau-kore, rarau-kore hoki te māwhai pīngao (*Cuscuta campestris*) ka ora i ētahi atu tipu.

He urupare tipu tāna e āhei ai tana pōkai haere i te tipu papa, ka peka haere kia rīraparapa te tipu, ka taea hoki te toro atu i te tipu papa ki ngā tipu pātata. Ka whakamahia tētahi hanga motuhake e kīia nei ko te *haustorium* hei whakamau i a ia ki te tipu papa, ka tipu ai ki roto i te pūtautau tonu o te tipu papa. Mā te *haustorium* e whai wai ai, e whai taioa ai hoki te tipu nei i te tipu papa.

He tino wā te wā puāwai mō te angitu o te whakaputa uri a te māwhai. Ka rangona e te tipu ngā tohu ā-taiao rerekē, mātua rā ngā rerekētanga o te roa o te pō (*photoperiod*). He itiiti noa iho e mōhiotia ana e pā ana ki ngā tohu e tīmata ai te puāwaitanga o te māwhai, heoi, e mōhiotia ana he tipu papa rā-poto (SDP), he tipu papa rā-roa hoki (LDP) ō te māwhai. Kua kitea e ngā kaimātai pūtaiao, i te āhua nei he tukutahi te puāwai o te māwhai me te puāwai o tana tipu papa, nā te mea ka puāwai tahi mai ngā momo e rua.

Matapakina ngā take e angitu ai te māwhai.

I tō tuhinga, me:

- tautuhi, me whakaahua hoki te hononga momo rerekē i waenga i te māwhai me te tipu papa
- whakamārama te āhua e taea ai e te māwhai te whanake me te pōkai haere i te tipu papa i te *auxin*; me tautuhi, me whakaahua hoki tēnei urupare tipu
- matapaki te āhua e angitu ai te māwhai i tana whai oranga i ētahi atu tipu, me te puāwaitanga ōna me tana tipu papa (ngā SDP me ngā LDP) i te wā kotahi.

He wāhi anō mō tō
tuhinga mō tēnei tūmahi kei te
whārangi e whai ake nei.

QUESTION THREE: DODDER



Source: https://upload.wikimedia.org/wikipedia/commons/4/42/Cuscuta_campestris_covering_host01.jpg

Source: <https://bygl.osu.edu/node/1682>

The golden dodder (*Cuscuta campestris*) is a leafless and rootless plant that lives off other plants.

It has a growth response, enabling it to wind up and around a host plant, branching to form a tangled mass, which can spread from the initial host to nearby plants. It uses a special organ, the haustorium, to attach itself to the host and grow into host tissues. Through the haustorium, it gains water and nutrients from the host plant.

The flowering time is critical for the successful reproduction of the dodder. Various environmental cues, especially changes in night length (photoperiod), are perceived by the plant. Very little is known about how flowering of the dodder is triggered to start; however it is known that the dodder has both short-day plant (SDP) hosts and long-day plant (LDP) hosts. Scientists have found that the flowering of the dodder seems to be synchronised with the flowering of their hosts, as they flower when the host does.

Discuss reasons for the success of the dodder.

In your answer:

- identify and describe the interspecific relationship between the dodder and the host plant
- explain how auxin enables the dodder to grow up and wind around the host plant, and identify and describe this growth response
- discuss how, through the ability to live off other plants and flowering at the same time as their hosts (both SDP and LDP), the dodder species is successful.

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

**He whārangi anō ki te hiahiatia.
Tuhia te tau tūmahi mēnā e hāngai ana.**

TE TAU
TŪMAHI

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

QUESTION
NUMBER

English translation of the wording on the front cover

Level 3 Biology 2022

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

Credits: Five

91603M

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.

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.

Check that this booklet has pages 2–15 in the correct order and that none of these pages is blank.

Do not write in any cross-hatched area (▨). This area may be cut off when the booklet is marked.

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