SUPERVISOR'S USE ONLY

Tirohia te uhi o muri e kitea ai te whakapākehātanga o tēnei uhi



91156M

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Tuhia he (⊠) ki te pouaka mēnā kāore koe i tuhi kōrero ki tēnei puka



Mana Tohu Mātauranga o Aotearoa New Zealand Qualifications Authority

Te Mātai Koiora, Kaupae 2, 2024

91156M Te whakaatu māramatanga ki ngā tukanga ora i te taumata pūtau

Ngā whiwhinga: E whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā tukanga ora i te taumata pūtau.	Te whakaatu māramatanga ki ngā tukanga ora i te taumata pūtau, kia hōhonu.	Te whakaatu māramatanga ki ngā tukanga ora i te taumata pūtau, kia tōtōpū.

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 KATOA 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 2-19 kei roto i tēnei pukapuka, ka mutu, kāore tētahi o aua whārangi i te takoto kau.

Kaua e tuhi i ngā paenga (2006). Ka poroa aua wāhanga ka mākahia ana te pukapuka.

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

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TE TŪMAHI TUATAHI: Te tukungao pūtau

- (a) Tuhia te whārite ā-kupu, te whārite matū **rānei** mō te tukupūngao ā-hāora.
- (b) He momo pūngāwerewere te *Phoneutria* ka kite nuitia i Amerika ki te Tonga, e kaha kīia nei ko te pūngāwerewere taiāmiki nō Parīhi.

Ka rangona te tõiriiri o ngā pārurenga e ngā huruhuru aronui i te tinana, ā, ka kaingia ngā ngārara, ngā mokomoko me ngā poraka. I te rā, he nui ngā haora ka huna ngā pūngāwerewere i raro i ngā kōporo me ngā toka, i roto rānei i ngā puke pōpokorua mā, i ngā rākau panana rānei.

E rongonui ana ēnei pūngāwerewere i te tino kakama me te raka hoki o te tinana, ā, e ai ki ētahi, koinei tētahi o ngā pūngāwerewere tere katoa i te ao. I te pūngāwerewere e whai pārurenga ana, e pūrere atu ana rānei i ngā konihi, ka eke tana tere ki te 50 cm i te hākona.



Te pūngāwerewere taiāmiki nō Parīhi e rapu pārurenga ana i te paparanga otaota.

Matapakina ngā tukanga o te tukupūngao hāora-kore me te tukupūngao ā-hāora, me hono hoki aua tukanga ki ngā mahi a te pūngāwerewere taiāmiki nō Parīhi.

I tō tuhinga, me whai wāhi te matapakinga o:

- ngā tukanga o te tukupūngao hāora-kore me te tukupūngao ā-hāora i te pūngāwerewere taiāmiki nō Parīhi, me te wāhi i te pūtau ka kitea ia momo tukupūngao
- te take ka poto noa iho te roa o tā te pūngāwerewere taiāmiki nō Parīhi tukupūngao hāorakore i te wā e kōkiri ana, e pūrere atu ana rānei
- ngā huanga me ngā mate ka puta i tā te pūngāwerewere taiāmiki nō Parīhi tukupūngao hāora-kore, tukupūngao ā-hāora hoki.

QUESTION ONE: Cellular respiration

- (a) Write the word equation **or** the chemical equation for aerobic respiration.
- (b) *Phoneutria* is a genus of spiders mainly found in South America, commonly referred to as Brazilian wandering spiders.

The sensitive hairs on their bodies help detect vibrations of passing prey, and they can feed on insects, lizards, and frogs. During the day, they will hide for many hours under logs, rocks, or inside termite mounds and banana plants.

These spiders are known for their remarkable speed and agility, and are considered to be one of the fastest spiders in the world. When capturing prey or escaping from predators, they can move at speeds of up to 50 cm per second.



Brazilian wandering spider searching leaf litter for prey.

Discuss the processes of anaerobic and aerobic respiration, linking them to the activities of the Brazilian wandering spider.

In your answer, include discussion of:

- the processes of anaerobic respiration and aerobic respiration in the Brazilian wandering spider, including where in the cell each form of respiration takes place
- why the Brazilian wandering spider can only carry out anaerobic respiration for short periods of time when attacking or escaping
- the advantages and disadvantages associated with the Brazilian wandering spider using both anaerobic and aerobic respiration.

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TE TŪMAHI TUARUA: Te ahotakakame

(a) Tapaina ngā wāhanga matua o te pūkāriki i te hoahoa i raro nei.

Te pūkāriki		
1.		
2.	-	
3.	-	

Ka kīia ngā rau o ētahi tipu e tupu ana i te maru he 'rau marumaru'. Ka rearima pea te whāomo ake o ēnei rau ki te hopu me te whakamahi i te hana o te rā, tēnā i ngā tipu e tupu nei ōna rau i ngā hihi tonu o te rā, e kīia nei he 'rau rā'.

He tere ake te tōmiti o te wai i ngā rau marumaru, tēnā i ngā rau rā, ina ōrite ngā āhuatanga o te taiao. E rahi ake ana ā-horahanga nei te nuinga o ngā rau marumaru, engari e rauangi ake ana i ngā rau rā. I te nuinga o te wā, ka nui ake hoki ngā pūkāriki o ngā rau marumaru, he maha ake hoki ngā pūkāriki i ia pūtau, tēnā i ngā rau ka tipu i te rā.

(b) Kōrerotia ngā pārongo o runga i tō arotake i te pānga o te hanga o te rau, o tōna rahi, me te maha hoki o ngā pūkāriki i ngā pūtau tipu, e te wātea mai o te aho.

I tō tuhinga, me whai wāhi te matapakinga o:

- te tukanga o te ahotakakame, me te whakaahua i ōna pae matua
- te hononga i waenga i te rahi me te maha o ngā pūkāriki i ngā rau marumaru me ngā rau rā, me te hāngai o te rerekētanga o te rahi me te maha ki te ahotakakame
- te take ka tere ake te tōmiti o te wai i ngā rau marumaru, tēnā i ngā rau rā, i ngā āhuatanga o te taiao e ōrite ana.

QUESTION TWO: Photosynthesis

(a) Label the key parts of the chloroplast in the diagram below.



Leaves of some plants that grow in the shade are known as 'shade leaves'. These leaves can be up to five times more efficient in capturing and using the same amount of sunlight as plants whose leaves grow in direct sunlight, which are known as 'sun leaves'.

Shade leaves lose water more quickly than sun leaves when all environmental conditions are the same. Shade leaves are generally larger in area but thinner than sun leaves. Shade leaves also tend to have larger chloroplasts, as well as more chloroplasts within each cell, compared to leaves that grow in full sunlight.

(b) With reference to the information above, evaluate how leaf structure, and the size and number of chloroplasts within plant cells, can be influenced by the availability of light.

In your answer, include discussion of:

- the process of photosynthesis, describing its key stages
- the correlation between the size and number of chloroplasts in shade leaves and sun leaves, and how this size and number difference is linked to photosynthesis
- why shade leaves would lose water more quickly than sun leaves under the same environmental conditions.

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TE TŪMAHI TUATORU: Te wehenga pūtau

I ngā tipu me ngā kararehe, ka pāngia ngā pūtau e te hurihanga tupu, kātahi ka wehe.



Te ōwehenga o te horahanga mata o te pūtau ki te rōrahi.

Arotakehia te pāpātanga o ngā panonitanga o te ōwehenga o te horahanga mata ki te rōrahi i te tukanga ingo, me ngā take pea ka tīmata te wehenga pūtau i ngā panonitanga ki taua ōwehenga.

I tō tuhinga, me whai wāhi te matapakinga o:

- te tukanga o te ingo me tana wāhi ki ngā mahi a ngā pūtau
- te āhua me te take e panonihia ai te ōwehenga o te horahanga mata ki te rōrahi i te wā e tipu ana te pūtau
- te pānga o te ōwehenga o te horahanga mata ki te rōrahi ki te nekehanga o ngā matū ki roto, ki waho hoki i te pūtau
- te hononga o te ōwehenga o te horahanga mata ki te rōrahi, ki te ingo, me te tīmatatanga o te wehenga pūtau, me whakatakoto hoki ētahi tauira o ngā pāpātanga nui o te wehenga pūtau i ngā tipu me ngā kararehe.

QUESTION THREE: Cell division

In both plants and animals, cells undergo a cycle of growth, followed by division.



Cell surface area to volume ratio.

Evaluate the impact of changes in the surface area to volume ratio on the diffusion process, and why changes in this ratio may trigger cell division.

In your answer, include discussion of:

- the process of diffusion and its role in cellular activities
- how and why the surface area to volume ratio undergoes changes during the growth of a cell
- how the surface area to volume ratio influences the movement of substances into and out of the cell
- the relationship between the surface area to volume ratio, diffusion, and the initiation of cell division, giving examples of when cell division rates are high in both plants and animals.

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	He whārangi anō ki te hiahiatia.	
TE TAU TŪMAHI	luhia te tau tumahi mena e hangai ana.	

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

	He whārangi anō ki te hiahiatia. Tubia to tau tūmabi mōnā o hāngai ana	
TE TAU TŪMAHI	funna te tau tunnani mena e nangai ana.	

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

He mea whakahāngai ngā kōrero i ngā mātāpuna e whai ake nei hei whakamahinga i tēnei aromatawai:

Te whārangi 2 https://factanimal.com/brazilian-wandering-spider/

Te whārangi 6 https://pmgbiology.com/tag/2-22/

Te whārangi 10 https://www.slideshare.net/slideshow/cell-growth-and-mitosis/43434373

Acknowledgements Material from the following sources has been adapted for use in this assessment:

Page 3 https://factanimal.com/brazilian-wandering-spider/

Page 7 https://pmgbiology.com/tag/2-22/

Page 11 https://www.slideshare.net/slideshow/cell-growth-and-mitosis/43434373

Level 2 Biology 2024

91156M Demonstrate understanding of life processes at the cellular level

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of life processes at the cellular level.	Demonstrate in-depth understanding of life processes at the cellular level.	Demonstrate comprehensive understanding of life processes at the cellular level.

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 2–19 in the correct order and that none of these pages is blank.

Do not write in the margins (22/22). This area will be cut off when the booklet is marked.

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