

See back cover for an English translation of this cover

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91156M



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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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Koiora, Kaupae 2, 2013

91156M Te whakaatu māramatanga ki ngā tukanga ora e pā ana ki te pūtau

9.30 i te ata Rāmere 22 Whiringa-ā-rangi 2013
Whiwhinga: Whā

Paetae	Paetae Kaiaka	Paetae Kairangi
Te whakaatu māramatanga ki ngā tukanga ora e pā ana ki te pūtau.	Te whakaatu māramatanga hōhonu ki ngā tukanga ora e pā ana ki te pūtau.	Te whakaatu māramatanga matawhānui ki ngā tukanga ora e pā ana ki te pūtau.

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 KATOĀ 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 2–21 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

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

PĀTAI TUATAHI: TUKUPŪNGAO¹

Ahakoā he tukangā pūtau tino waiwai te tukupūngao ā-hāora² i roto i ngā tipu me ngā kararehe, ka whakaawe te wāhi me te taumahi a te pūtau i roto i tētahi rauropi i te pāpātanga e tūpono ai te tukupūngao. Ko te tikanga kitea ai i ngā pūtau e mahi ana i ngā nuinga tukupūngao rerekē ngā rahinga rerekē o te whēkauiti e mahi ai te tukupūngao ā-hāora.

Matapakitia te tukangā o te tukupūngao ā-hāora.

I tō whakautu:

- whakaahuatia te whāinga o te tukupūngao ā-hāora
- whakaahuatia ngā mea e hiahia ana kia mahi ai te tukupūngao ā-hāora, ka whakaingoa i ngā hua o te tukangā
- whakaingoa te whēkauiti i te wāhi e haere ai te tukupūngao ā-hāora, ka whakahāngai atu i tana hanganga ki tana taumahi
- homai ētahi pūtake mō ngā rahinga rerekē o tēnei whēkauiti, ā, kia RUA i te itinga rawa ngā taura hei parahau i tō whakautu.

1 WHAKAHĀ

2 hāoraora

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

QUESTION ONE: RESPIRATION

Although aerobic respiration is an essential cell process in both plants and animals, the location and function of the cell in an organism influences the rate at which respiration takes place. Cells that carry out different levels of respiration are usually found to have different amounts of the organelle in which aerobic respiration occurs.

Discuss the process of aerobic respiration.

In your answer:

- describe the purpose of aerobic respiration
- describe what is required for aerobic respiration to occur, and name the products of the process
- name the organelle where aerobic respiration takes place, and relate its structure to its function
- give reasons for the differences in amounts of this organelle, supported by a minimum of TWO justified examples.

PĀTAI TUARUA: AHOTAKAKAME

He hāngai tika tonu te pāpātanga o te ahotakakame ki te wāteatanga o te tūrama³. I te nuinga o te wā, ka piki te kaha tūrama ka piki anō te pāmahana. Engari, ki te teitei rawa te pāmahana, ka heke, ka mutu tonu pea te pāpātanga o te ahotakakame. I kitea i ngā whakamātauranga mēnā ka aumou haere tonu te tūrama engari ka whakarerekēhia mōtuhaketia te pāmahana, ka kitea tonutia te huri o te pāpātanga o te ahotakakame.

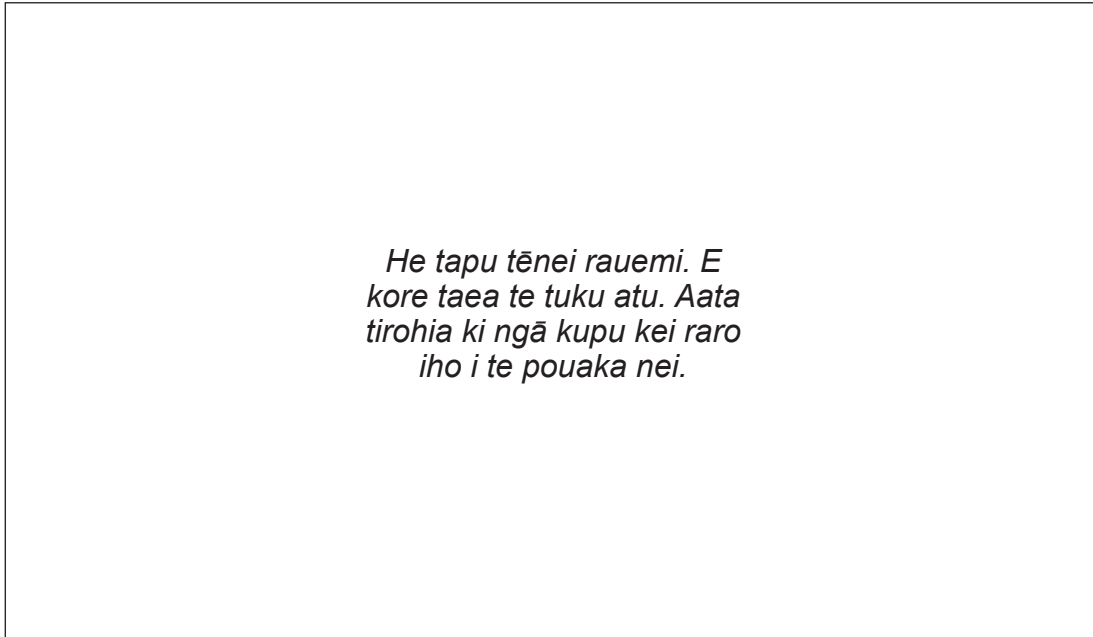
- (a) Mā te kōrero mō te hanganga me te taumahi a ngā pūmua whākōkī, me ngā āhuatanga tino pai rawa mō ēnei, whakamāramahia he aha i rerekē ai te pāpātanga o te ahotakakame nā ngā huringa pāmahana.

QUESTION TWO: PHOTOSYNTHESIS

The rate of photosynthesis is directly related to the availability of light. Normally, an increase in light intensity also leads to an increase in temperature. However, if the temperature gets too high, the rate of photosynthesis may decrease or even stop completely. Experiments have shown that if light is kept constant but temperature is varied independently, then the rate of photosynthesis can still be seen to change.

- (a) With reference to the structure and function of enzymes, and the conditions that they are best suited to, explain why the rate of photosynthesis varies with changes in temperature.

- (b) He mea hanga mai te rau i ētahi momo pūtau rerekē. E hāngai ana te hanga, rahi, me te kukū pūmāota⁴ ki tā rātou taumahi.



He mea urutau i V. Slaughter, *Living Things* (Rānana: Hodder & Stoughton, 1980), wh. 30.

E ai ki te hoahoa i runga, matapakitia he pēhea te wāhi me te hanganga o ngā pūtau ME ngā whēkauiti i roto i tētahi rau tipu e whakamōrahi ake ai i te pāpātanga o te ahotakakame.

I tō whakautu:

- whakaahuatia ngā momo pūtau rerekē ka kitea i roto i tētahi rau pūnoa
- whakaahuatia te hanganga o te whēkauiti e whakahaerehia ai te ahotakakame
- whakamāramahia he pēhea ngā hanganga i whakaahuatia e koe e tuku ai kia mahia ngā taumahi
- whakahāngaitia te hanganga me te taumahi a ngā pūtau me ngā whēkauiti ki te pāpātanga o te ahotakakame.

Ka taea e koe te tuhi hoahoa i roto i te pouaka wātea hei tautoko i tō whakautu.

⁴ pūkārīki

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PĀTAI TUATORU: WEHENGĀ PŪTAU

Ka puaki mai te whāu pūira⁵ i roto i te mataora⁶ o ngā kararehe me ngā tipu.

- (a) Whakaahuatia he aha te tikanga o te whāu pūira.

He kikoruatanga⁷ āhua-tūpatopato te kōrero i te nuinga o te wā mō te tukanga kikoruatanga pūtauirā.

- (b) Whakamāramahia mai ka pēhea ngā pūira e kikoruatia ai, ā, he aha i kīia ai tēnei tukanga he kikoruatanga āhua-tūpatopato.

Ka taea e koe te tuhi hoahoa whai tapanga ki te pouaka wātea hei tautoko i tō whakautu.

⁵ maitohi

⁶ hurihanga ora

⁷ tāruatanga

**Ka haere tonu te Pātai Tuatoru
kei te whārangi 16.**

QUESTION THREE: CELL DIVISION

Mitosis occurs during the life cycles of both animals and plants.

- (a) Describe what is meant by mitosis.

The process of DNA replication is usually referred to as semi-conservative replication.

- (b) Explain the process of how chromosomes are replicated, and why the process is known as semi-conservative replication.

You may draw a labelled diagram(s) in the box provided to support your answer.

**Question Three continues
on page 18.**

- (c) Tata ki te katoa o ngā kararehe me ngā tipu ka tipu mai i tētahi pūtau whakakikiri ka wehe ki ētahi momo pūtau, pūtautau rerekē. Ka tino rerekē te pāpātanga o te whāu pūira, kei te wāhi o ngā pūtau me te wāhanga mataora o te rauropi.

Matapakitia ngā kīanga i runga ake.

Me whakauru ki tō whakautu:

- tētahi whakaahuatanga o ngā mea ka pā ki te pāpātanga o te whāu pūira
- ngā pūtake he aha i rerekē ai ngā pāpātanga whāu pūira i ngā wāhanga mataora rerekē o tētahi rauropi
- kia rua i te itinga rawa ngā tauira, me ngā pūtake, o ngā wāhanga o ngā tipu me ngā kararehe tērā pea e teitei ake ai te pāpātanga o te whāu pūira.

- (c) Almost all animals and plants develop from a fertilised cell that divides into different types of cells and tissues. The rates of mitosis vary considerably, depending on the location of the cells and the stage in the organism's life-cycle.

Discuss the statements above.

In your answer include:

- a description of what affects the rate of mitosis
- reasons why the stages of an organism's life-cycle have different rates of mitosis
- at least two examples, with reasons, of the parts of plants and animals where the rate of mitosis is likely to be higher.

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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

Lined writing area with horizontal lines and a vertical margin line on the left.

English translation of the wording on the front cover

Level 2 Biology, 2013

91156 Demonstrate understanding of life processes at the cellular level

9.30 am Friday 22 November 2013
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 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 2–21 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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