

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

SUPERVISOR'S USE ONLY

Koiora, Kaupae 2, 2014

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

9.30 i te ata Rāhina 17 Whiringa-ā-rangi 2014
Whiwhinga: Whā

Paetae	Kaiaka	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 ngā pātai KATOA 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

PĀTAI TUATAHI: WEHENGĀ PŪTAU

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

http://en.wikipedia.org/wiki/Cell_cycle

- (a) E whakaatu ana te pikitia i runga i ngā pūtau riki i roto i ngā takahanga rerekē o te huringa pūtau. Kāore ngā pūtau **A**, **B** me **C** i roto i te raupapa e mahi ai te wehenga pūtau.

Me whakatakoto mai ki te raupapa tika.

- (b) Matapakitia matawhānuitia he pēhea te wehenga pūtau, me te take hoki.

Ki tō whakautu:

- whakaahuahia te tukanga o te whāu pūira¹
- whakamāramahia ngā tukanga o te tāruaruatanga pītauira, ā, me te āhua o tana tuku kia mahi ai te whāu pūira
- matapakitia, mā te homai pūtake, āhea, he aha hoki i wehe ai ngā pūtau nā ētahi āhuatanga rerekē, ME te tuku tauira hei tautoko i tō whakautu.

Ka whakaaetia te whakamahi hoahoa hei tautoko i tō whakautu.

**He wāhi anō mō tō whakautu
ki tēnei pātai kei te whārangi 4.**

¹ maitohi

QUESTION ONE: CELL DIVISION

http://en.wikipedia.org/wiki/Cell_cycle

- (a) The picture above shows onion cells in different phases of the cell cycle. The cells labelled **A**, **B** and **C** are not in the sequence that cell division occurs in.

Put them in the correct sequence.

- (b) Comprehensively discuss how and why cells divide.

In your answer;

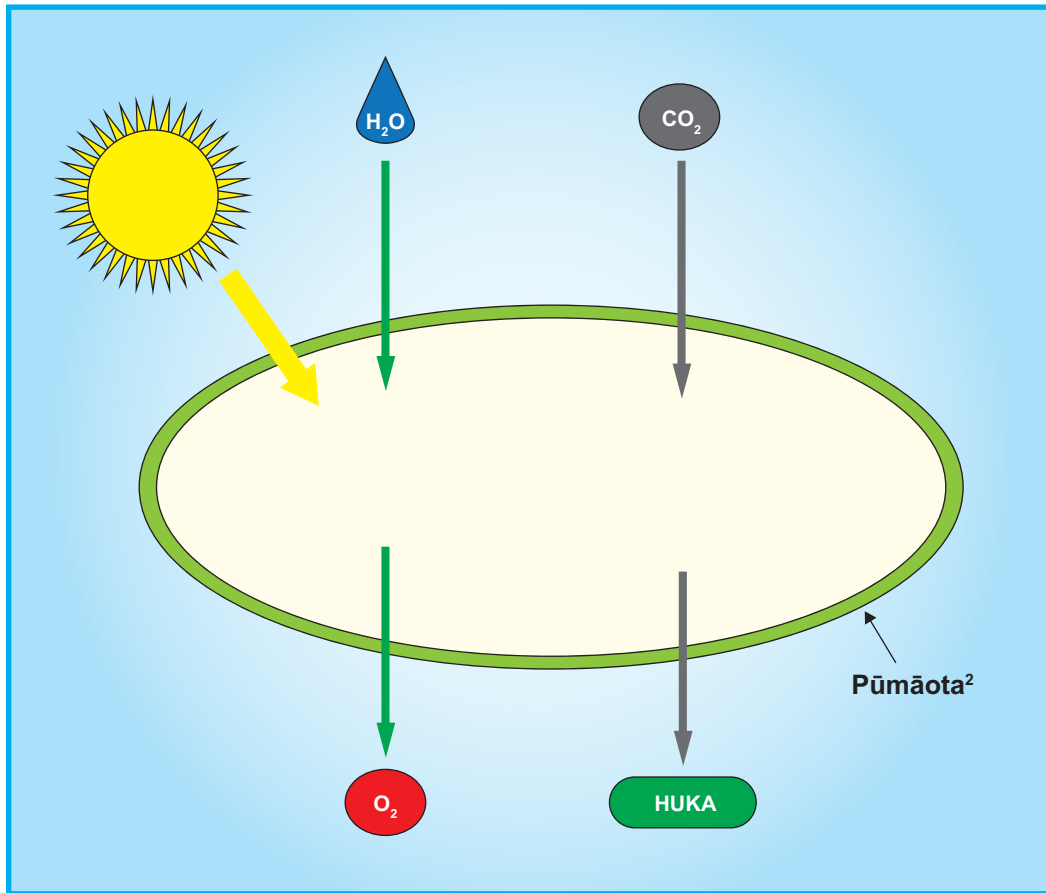
- describe the process of mitosis
- explain the process of DNA replication and how it allows mitosis to occur
- discuss, by giving reasons, when and why different factors cause the cells to divide, AND provide examples to support your answer.

You may use diagrams to support your answer.

There is more space for your answer to this question on page 5.

PĀTAI TUARUA: TE AHOTAKAKAME

He tukanga pūtau hira te ahotakakame e kawea ana e ngā pūtau rau kākārīki me ngā pūtau tipu tō. E whakaatu ana te hoahoa o raro i tēnei tukanga pūtau.



He mea urutau mai i: http://bioweb.uwlax.edu/bio203/2011/kruse_sara/nutrition.htm

Matapakitia ngā āhuatanga e pā ana ki te pāpātanga o te tukanga ahotakakame.

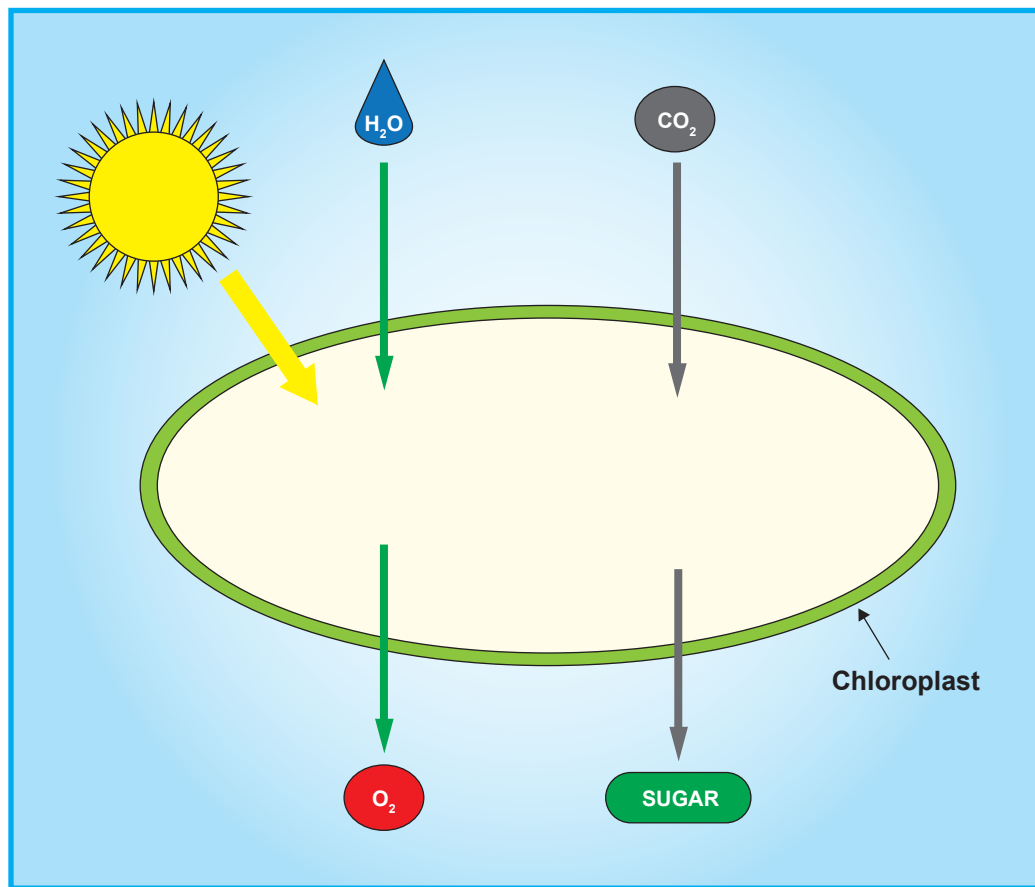
Ki tō whakautu:

- whakaahuahia te ahotakakame me te homai i tētahi whārite kupu mō tēnei tukanga pūtau
- whakamāramahia he pēhea te pā o te wai me te hauhā ki te pāpātanga o te ahotakakame
- matapaki taipitopitotia he pēhea te pā o ētahi atu āhuatanga i tua atu i te hauhā me te wai ki te pāpātanga o te ahotakakame.

**He wāhi anō mō tō whakautu
ki tēnei pātai kei te whārangi 8.**

QUESTION TWO: PHOTOSYNTHESIS

Photosynthesis is an important cell process carried out by green leaf and stem plant cells. The diagram below shows this cellular process.



Adapted from: http://bioweb.uwlax.edu/bio203/2011/kruse_sara/nutrition.htm

Discuss the factors that affect the rate of photosynthesis.

In your answer:

- describe photosynthesis and give a word equation for this cell process
- explain how water and carbon dioxide can affect the rate of photosynthesis
- discuss in detail how factors other than carbon dioxide and water affect the rate of photosynthesis.

There is more space for your answer to this question on page 9.

PĀTAI TUATORU: NGĀ PUNARAUNGAO³

E kitea ana ngā punaraungao i roto i ngā pūtau kararehe, tipu hoki. He tino rerekē te maha o ngā punaraungao kei roto i ia pūtau. Kāore he punaraungao i roto i ngā pūtau whero, ā, tērā pea he mano tini kei roto i ngā pūtau uaua. E whakaatu ana te tūtohi i raro i te āhua e rerekē ai pea te maha o ngā punaraungao i roto i ngā pūtau rerekē.

Momo pūtau tangata	Te maha o ngā punaraungao
Pūtau toto whero	0
Pūtau kiri	whakatau tata 200
Pūtau ate	1000–2000
Pūtau uaua manawa	5000+

- (a) Tātuhia he hoahoa o tētahi punaraungao, me te tapa i ngā hanganga: te kiriuhi o waho, te kiriuhi o roto, te anga ā-roto (matrix), me ngā apa ā-roto (cristae).

- (b) Mā te whakamahi i ngā tauira rerekē i roto i te tūtohi i runga, matapakitia he aha i rerekē ai te maha o ngā punaraungao i roto i ngā momo pūtau tangata rerekē.

Ki tō whakautu:

- whakamāramahia te tukanga pūtau e whakahaerehia ana e ngā punaraungao, me te kaupapa o tēnei tukanga
- homai ngā pūtake e rerekē ai te maha o ngā punaraungao e kitea ana i roto i ngā momo pūtau rerekē
- whakatakoto whakaritenga i waenga i ngā momo pūtau rerekē i roto i te tūtohi, ME te tūhono i te maha o ngā punaraungao i roto i te pūtau ki tāna mahi me ngā hiahiatanga pūngao.

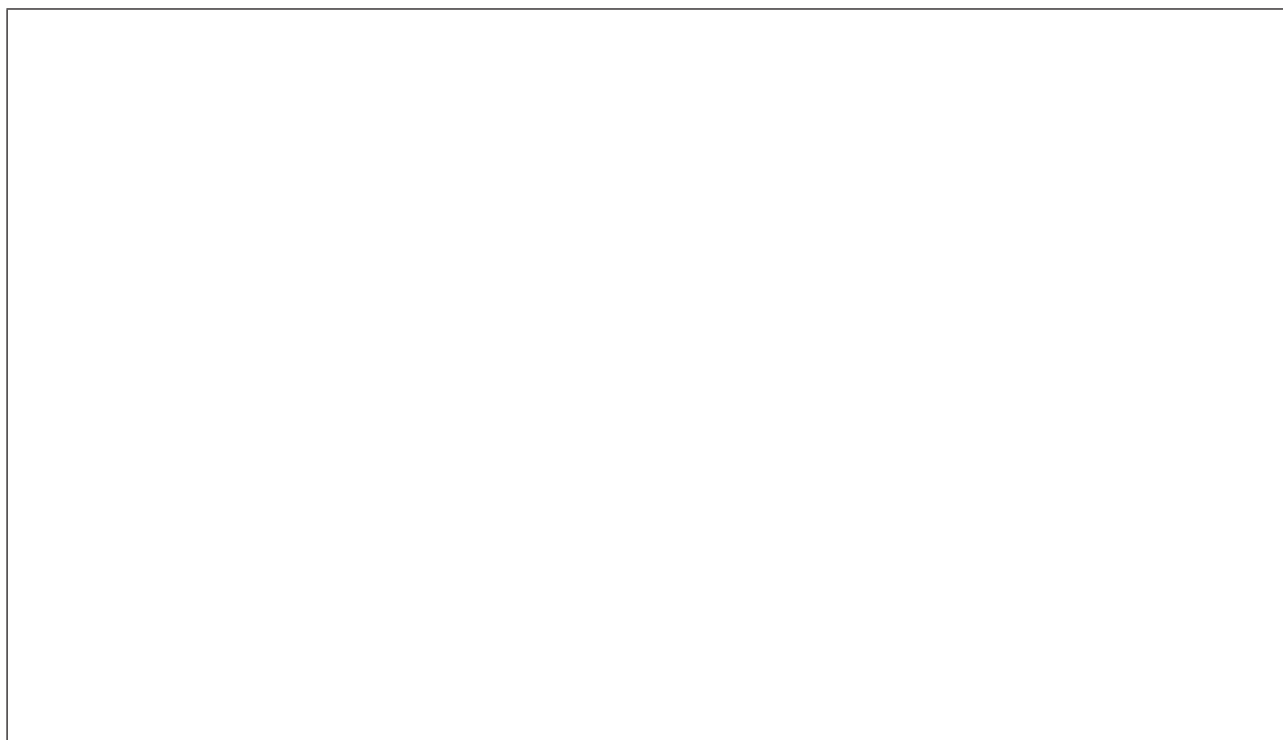
³ pata pūngao

QUESTION THREE: MITOCHONDRIA

Mitochondria are found in animal and plant cells. The number of mitochondria per cell can vary widely. Red blood cells do not contain any mitochondria, whereas muscle cells may contain hundreds or thousands. The table below shows how the number of mitochondria can vary in different cells.

Human cell type	Number of mitochondria
Red blood cell	0
Skin cell	approx. 200
Liver cell	1000–2000
Heart muscle cell	5000+

- (a) Draw a diagram of a mitochondrion, labelling the structures: outer membrane, inner membrane, matrix, and cristae.



- (b) Using the examples in the table above, discuss why there are different numbers of mitochondria in different types of human cells.

In your answer:

- explain the cell process that mitochondria carry out, and the purpose of this process
- provide reasons why different numbers of mitochondria are found in different types of cells
- make comparisons between the different types of cells in the table, AND link the number of mitochondria in the cell to its function and energy requirements.

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

TAU PĀTAI

MĀ TE
KAIMĀKA
ANAKE

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

QUESTION
NUMBER

ASSESSOR'S
USE ONLY

English translation of the wording on the front cover

Level 2 Biology, 2014

91156 Demonstrate understanding of life processes at the cellular level

9.30 am Monday 17 November 2014
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.

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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.