91156M

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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

2

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Koiora, Kaupae 2, 2016

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

9.30 i te ata Rāmere 18 Whiringa-ā-rangi 2016
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 mēnā 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.

Mēnā ka hiahia whārangi atu anō koe mō ō tuhinga, whakamahia te (ngā) whārangi wātea kei muri o tēnei pukapuka, ka āta tohu ai i te tau tūmahi.

Tirohia mēnā 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.

ME HOATU RAWA KOE I TĒNEI PUKAPUKA KI TE KAIWHAKAHAERE Ā TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

© Mana Tohu Mātauranga o Aotearoa, 2016. Pūmau te mana.
Kia kaua rawa he wāhi o tēnei tuhinga e whakahuatia ki te kore te whakaaetanga tuatahi a te Mana Tohu Mātauranga o Aotearoa.

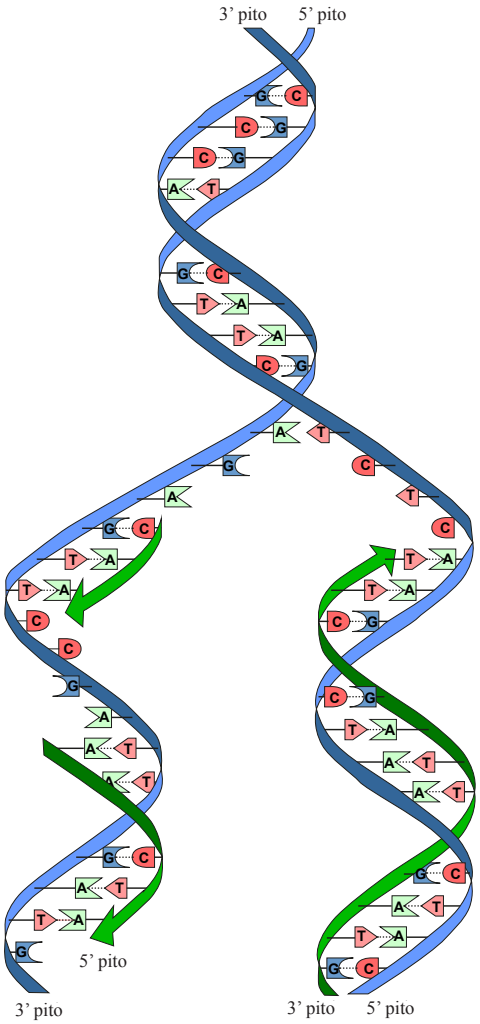
MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATAHI: TE TUKURUATANGA PĪTAU IRA

(a) E whakaatu ana te tauira i raro i te tukuruatanga pītau ira.

Tapaia ēnei e whai ake ki te hoahoa:

- pūiokarihi (nucleotide)
- pāpāhua hauota
- hononga hauwai
- aho matua
- aho tamāhine
- tuaiwi huka-pākawa tūtaewhetū.



(b) Whakamāramahia te whāinga o te tukuruatanga pītau ira.

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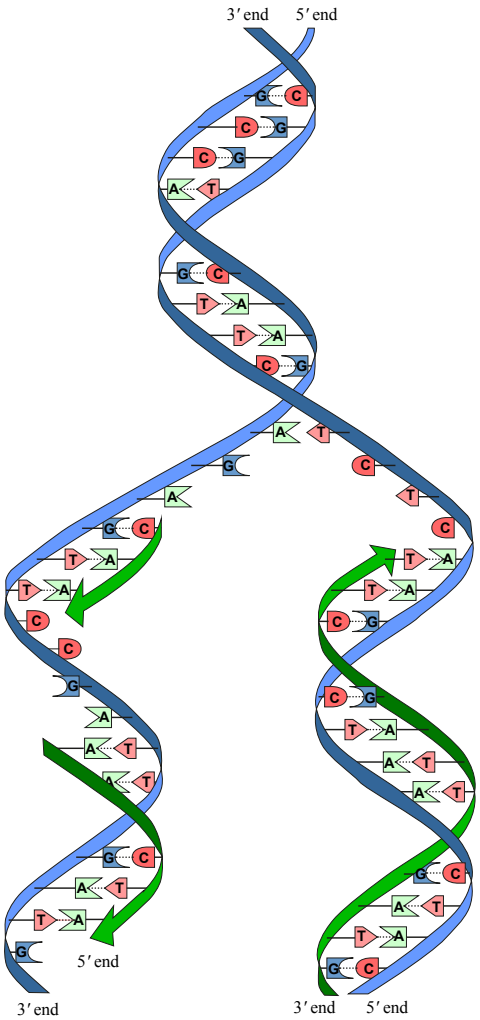
QUESTION ONE: DNA REPLICATION

(a) The model below shows DNA replication.

Label the following on the diagram:

- nucleotide
- nitrogen base
- hydrogen bond
- parent strand
- daughter strand
- sugar-phosphate backbone.



(b) Explain the purpose of DNA replication.

MĀ TE KAIMĀKA ANAKE

(c) E hiahiatia ana ngā pūmua whākōkī mō te tukuruatanga pītau ira.

Matapakitia te mahi a ngā pūmua whākōkī i roto i te tukuruatanga pītau ira me ngā āhuatanga ka pā ki aua pūmua whākōkī.

Me whakauru ki roto i tō tuhinga:

- he whakaahuatanga o te hanganga o tētahi pūmua whākōki
- he whakamāramatanga he pēhea te mahi a ngā pūmua whākōki i roto i te tukuruatanga pītau ira
- he matapakinga o ētahi āhuatanga e toru i te iti rawa ka whai pānga ki ngā pūmua whākōki i te wā o te tukuruatanga pītau ira.

Ka whakaaetia te whakamahi hoahoa hei tautoko i tō tuhinga.

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei te whārangi 6.

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(c) Enzymes are needed for DNA replication.

Discuss the function of enzymes in DNA replication and the factors that affect them.

In your answer include:

- a description of the structure of an enzyme
- an explanation of how enzymes function in DNA replication
- a discussion of at least three factors that affect enzymes during DNA replication.

You may use diagrams in your answer.

There is more space for your answer to this question on page 7.

MĀ TE KAIMĀKA ANAKE

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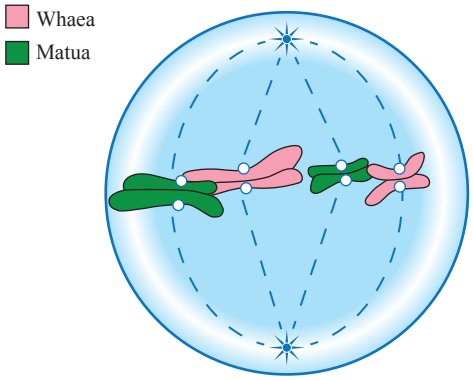
MĀ TE KAIMĀKA ANAKE

TŪMAHI TUARUA: TE WHĀŪ PŪIRA[1] ME TE NEKEHANGA O NGĀ MATŪ



he mea urutau mai i: https://www.bio.purdue.edu/BCBLab/?p=1093

(a) Whakaahuahia mai kei te aha i roto i te hoahoa i runga ake mā te whakamahi i te whāū pūira.

(b) Whakamāramahia mai te pūtake o te whāū pūira, me te puta hoki o tēnei momo wehenga pūtau.

[1] maitohi

QUESTION TWO: MITOSIS AND MOVEMENT OF MATERIALS

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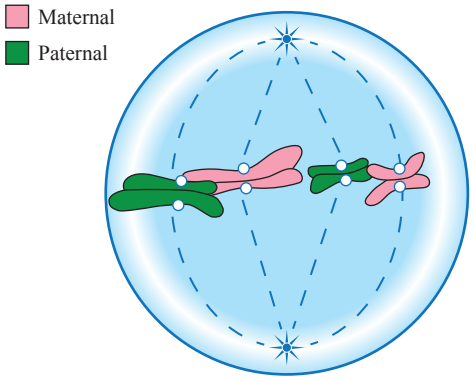

adapted from: https://www.bio.purdue.edu/BCBLab/?p=1093

(a) Describe what is happening in the diagram above during mitosis.

(b) Explain the purpose of mitosis, and how this type of cell division occurs.

MĀ TE KAIMĀKA ANAKE

(c) Ko te nuinga o ngā pūtau i roto i te tinana tangata ka tipu ki tētahi rahi whāiti kātahi ka whakawehe. Ka tipu ngā pūtau hou, ēngari ka whakawehe anō ina tae ki tētahi rahi.

Matapakitia he pēhea te pānga o te ōwehenga o te horahanga mata ki te rōrahi ki te tukanga o te ingo, ā, he aha ngā huringa ki te ōwehenga o te horahanga mata ki te rōrahi i whakawehe ai pea i te pūtau.

Me whakauru ki roto i tō tuhinga:

- he whakaahuatanga e pēhea ana te huri o te ōwehenga o te horahanga mata ki te rōrahi i te wā e tipu ana te pūtau
- he whakamāramatanga he pēhea te pānga o te ōwehenga o te horahanga mata ki te rōrahi ki te nekehanga o ngā matū ki roto me waho o tētahi pūtau
- he whakamāramatanga mō te ingo
- he matapaki ka pēhea te pānga o te ōwehenga o te horahanga mata ki te rōrahi ki te ingo me te whakawehe pūtau.

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei te whārangi 12.

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(c) Most cells in the human body grow to a limited size then divide. The new cells grow, but also divide when they have reached a certain size.

Discuss how the surface area to volume ratio affects the process of diffusion, and why the changes in surface area to volume ratio may cause the cell to divide.

In your answer include:

- a description of how the surface area to volume ratio changes as the cell grows
- an explanation of how the surface area to volume ratio affects the movement of materials into and out of a cell
- an explanation of diffusion
- a discussion of how the surface area to volume ratio can affect diffusion and cell division.

There is more space for your answer to this question on page 13.

MĀ TE KAIMĀKA ANAKE

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MĀ TE KAIMĀKA ANAKE

TŪMAHI TUATORU: NGĀ TUKANGA PŪTAU

He tukanga pūtau te ahotakakame me te tukupūngao pūtau e whakahaerehia ana i roto i tētahi tipu.

Matapakitia ngā ōritetanga me ngā rerekētanga i waenga i te ahotakakame me te tukupūngao pūtau ā-hāora i roto i tētahi tipu.

Me whakauru ki roto i tō tuhinga:

- tētahi whārite kupu o te ahotakakame me te tukupūngao pūtau ā-hāora
- tētahi whakamāramatanga mō te āhua e hiahiatia ana te tukupūngao pūtau ā-hāora me te ahotakakame hei tautoko i te oranga whānui o te tipu
- tētahi matapakinga mō ngā ōritetanga me ngā rerekētanga o ngā tukanga e rua.

http://www.ecoagra.com/eA_BPP-HowItWorks.html

KĀORE i te hiahiatia ngā taipitopito whāiti o ngā wāhanga mō ia tukanga.

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei te whārangi 16.

QUESTION THREE: CELL PROCESSES

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Photosynthesis and cell respiration are cell processes carried out within a plant.

Discuss the similarities and differences between photosynthesis and aerobic cell respiration in a plant.

In your answer include:

- a word equation of photosynthesis and aerobic cell respiration
- an explanation of how both aerobic cell respiration and photosynthesis are required to support the overall survival of the plant
- a discussion of the similarities and differences of the two processes.

http://www.ecoagra.com/eA_BPP-HowItWorks.html

Specific details of stages for each process are NOT required.

There is more space for your answer to this question on page 17.

MĀ TE KAIMĀKA ANAKE

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He whārangi anō ki te hiahiatia.
Tuhia te (ngā) tau tūmahi mēnā e tika ana.

TAU TŪMAHI

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 2 Biology, 2016

91156 Demonstrate understanding of life processes at the cellular level

9.30 a.m. Friday 18 November 2016
Credits: Four

91156M

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 2–19 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.