91606M

916065

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

3

SUPERVISOR'S USE ONLY

Koiora, Kaupae 3, 2018

91606M Te whakaatu māramatanga ki ngā ia i roto i te kunenga tangata

2.00 i te ahiahi Rāhina 19 Whiringa-ā-rangi 2018
Whiwhinga: Whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā ia i roto i te kunenga tangata.	Te whakaatu māramatanga hōhonu ki ngā ia i roto i te kunenga tangata.	Te whakaatu māramatanga matawhānui ki ngā ia i roto i te kunenga tangata.

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 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 2–27 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, 2018. 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.

TŪMAHI TUATAHI

I kitea ngā parawae anga kōiwi o te *Homo naledi* i te tau 2013, ā, nā tēnei i pupū ake ngā taupatupatu i waenga i ngā tohunga pūtaiao kei hea tēnei i roto i te kunenga o ngā tāngata onamata. E whakaatu ana ngā āhua o te *Homo naledi* i urutau kia pai ai te tū me te hīkoi i runga i ngā waewae e rua, engari ko te āhua nei he pai anō ki te pikipiki rākau.

Kei roto i ngā parawae anga kōiwi o te *Homo naledi* ko ngā āhua o te momo *Homo* me te momo *Australopithecus*.

He mea urutau nō: https://goo.gl/ro5MNn, https://goo.gl/A5TGSY, https://goo.gl/uyYiar, https://goo.gl/UwKjUN, https://goo.gl/osEFtx

He whakatau tata o te rākau kunenga whakapapa o ngā tāngata onamata

https://subtextlife.weebly.com/diepkant/october-01st-2014

QUESTION ONE

Homo naledi skeletal fossils were found in 2013, and this has created debate amongst scientists as to where it belongs in hominin evolution. *Homo naledi* has features that meant it was well adapted for standing and walking on two feet, but that it is also likely that it was comfortable climbing trees.

The skeletal fossils of *Homo naledi* have features of both *Homo* species and *Australopithecus* species.

Adapted from: https://goo.gl/ro5MNn, https://goo.gl/A5TGSY, https://goo.gl/uyYiar, https://goo.gl/UwKjUN, https://goo.gl/osEFtx

Estimated hominin phylogeny

https://subtextlife.weebly.com/diepkant/october-01st-2014

MĀ TE KAIMĀKA ANAKE

Mā te whakamahi i ngā whakaaturanga parawae kei ngā hoahoa me ō mōhio mō te kunenga o te tangata onamata, me whakaahua me te whakamārama he pēhea te tautoko a ngā āhua koiora o te *Homo naledi* i te whakaaro ka taea e rātou te hīkoi tū tika, Ā, he pai anō ki te pikipiki rākau.

Me whakamahi ngā whakaaturanga anga kōiwi hei whakamārama me te parahau i te wāhi ka whakatakotohia e koe te *Homo naledi* ki te rākau kunenga whakapapa o te tangata onamata kei te whārangi 2.

I tō tuhinga, me:

- whakaahua kia TORU ngā āhua i āwhina i te nekeneke waerua me ngā āhua e TORU i āwhina ki te pikipiki rākau
- whakamārama he aha aua āhua i āwhina ai i te nekeneke waerua, te pikipiki rākau rānei
- whakataurite ngā āhua e kī ana nō te tipuna kotahi tino tawhito, tata ake RĀNEI te *Homo naledi* me te *Homo sapiens*.

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei ngā whārangi o muri mai.

ASSESSOR'S USE ONLY

Using the fossil evidence in the diagrams provided and your knowledge of hominin evolution, describe and explain how biological features in *Homo naledi* support the idea that they could walk bipedally AND were also good tree climbers.

Use the skeletal evidence to explain and justify where you would place *Homo naledi* in the suggested hominin evolutionary phylogeny provided on page 3.

In your answer:

- describe THREE features that assisted with bipedal movement and THREE features that assisted with tree climbing
- explain why these features assisted bipedal movement or tree climbing
- compare and contrast features that suggest *Homo naledi* share a distant OR more recent common ancestor with *Homo sapiens*.

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

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

TŪMAHI TUARUA

http://media-2.web.britannica.com/eb-media/53/42153-004-BAA9B07B.jpg

Ko te pūmua whākōkī ngako (lactase) ka puta ki ngā pēpi, ka āwhina ki te wāwāhi i te reihuka. I ētahi wāhi kua kitea te pikitanga o tēnei pūmua whākōkī i roto i ngā taupori pakeke i roto i ngā tau 11 000 kua hipa.

https://goo.gl/LdGmtJ

Nā te nui haere o te roro, nā te kaha ki te kōrero me ngā wehewehenga mahi i puta ai ngā mahi ahuwhenua.

Me aromātai ngā pānga o te whanaketanga o te whakaaro waitara, te kohikohi kai (te aruaru, te whakatipu māra me te kararehe), me ngā whakaruru (ngā ana, nōhanga wā poto, nōhanga tūturu) ki te kunenga ahurea me te kunenga koiora o te *Homo sapiens*, me te kōrero hoki mō te ahuwhenua.

I tō tuhinga, me:

- whakaahua te ahuwhenua, te kunenga ahurea ME te kunenga koiora
- whakamārama he pēhea te pānga o te whanaketanga o te whakaaro waitara, kohikohi kai, me ngā whakaruru ki te kunenga ahurea me te kunenga koiora
- aromātai ngā huapai me ngā huakino o te whanaketanga o te ahuwhenua ki te kunenga o te *Homo sapiens*.

QUESTION TWO

http://media-2.web.britannica.com/eb-media/53/42153-004-BAA9B07B.jpg

The lactase enzyme that is present in infants, assists with the breakdown of lactose. Some areas have shown an increase in this enzyme in the adult populations over the past 11 000 years.

https://goo.gl/LdGmtJ

With increased brain size, the ability of speech and the division of labour led to the development of agriculture.

Evaluate the effects that the development of abstract thought, food gathering (hunter-gatherer, domestication of plants and animals), and shelter (caves, temporary settlement, permanent settlement) had on the cultural and biological evolution of *Homo sapiens* with reference to agriculture.

In your answer:

- describe agriculture, cultural evolution, AND biological evolution
- explain how the development of abstract thought, food gathering, and shelter may have affected cultural and biological evolution
- evaluate the advantages and disadvantages of the development of agriculture on the evolution of *Homo sapiens*.

MĀ TE KAIMĀKA ANAKE

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei ngā whārangi o muri mai.

ASSESSOR'S USE ONLY

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

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

TŪMAHI TUATORU

Kua marara te tangata hou nei ki ngā tōpito katoa o te ao. E rua ngā tino ariā ko te I Ahu Mai i Āwherika, te Tauira Whakakapi rānei, me te Tauira Rohemaha rānei. E kī ana ngā ariā hou rawa o te mararatanga o te tangata nā te whakaputa uri whakawhiti momo a te *Homo sapiens* i a rātou e heke ana me ētahi atu tangata onamata i āwhina i te hekenga.

Kunenga ahurea

https://goo.gl/sSFLH1

https://goo.gl/ERmKbC

https://goo.gl/ERmKbC

Tauira "I Ahu Mai i Āwherika" ki te Tauira Rohemaha

He mea urutau nō: https://www.nature.com/scitable/content/Out-of-Africa-versus-the-multiregional-hypothesis-6391

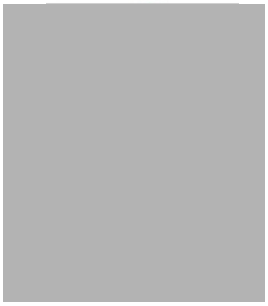
Ngā taumata rerenga kētanga ā-ira i waenga i ngā taupori 51

He mea urutau nō: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262934/

QUESTION THREE

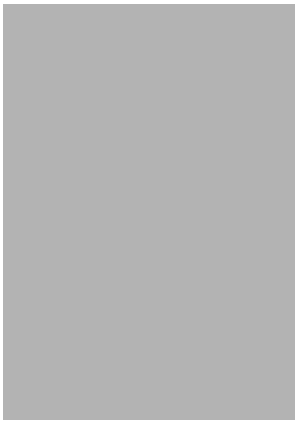
Modern humans have dispersed throughout the world. The two main theories are the Out of Africa or Replacement Model, and the Multiregional Model. The latest theories of human dispersal suggest that migrating *Homo sapiens* interbreeding (admixture) with earlier hominins helped with migration.

Cultural evolution



https://goo.gl/sSFLH1

https://goo.gl/ERmKbC



https://goo.gl/ERmKbC

Out of Africa versus the Multiregional Model

Adapted from: https://www.nature.com/scitable/content/Out-of-Africa-versus-the-multiregional-hypothesis-6391

Levels of genetic diversity between 51 populations

Adapted from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262934/

MĀ TE KAIMĀKA ANAKE

Ko te whakaputa uri whakawhiti momo onamata mā te raupapa huingaira katoa e whakaatu ana i te hekenga o te *Homo sapiens*

https://aspergerhuman.files.wordpress.com/2015/06/nrg3625-f1.jpg

Ngā ira whaitake nō te kunenga o te tangata onamata

Ira	**Mahi**
FOXP2	He whaitake te pūmua ka puta mō te tohu i ngā wāhanga o te roro i whakamahia mō te reo me te kōrero.
SRGAP2	Ka āwhina te ira ki te kōkiri i te whanaketanga o te kiriroro-hou e whakamahia ana i roto i te tangata mō te reo me te whakaaroaro.
HACNS1	He whakarākei i te ira e pā ana ki te whanaketanga o ngā peke, otirā te kawititanga o te ringa me te kōnui o te tangata.
EPAS1	Nō te Denisovan, ā, ka kitea i roto i ngā tāngata o Tīpeti i tēnei wā. Ka tuku kia nui ake te whakaputa pūtau toto wero kia pakari tonu ai mēnā he iti rawa te hāora i ngā wāhi whenua tiketike.
HLA	I ngā Neanderthal me ngā Denisovan tēnei ira e āwhina ana i ngā pūtau toto mā ki te patu i ngā kaiurutomo moroiti e pā mai ai ngā mate ki ō tātou tinana.

Me tātari ngā mōhiohio kua tukuna me te matapaki i pēhea te āwhina a te kunenga koiora me te kunenga ahurea i te mararatanga o te tangata. Me aromātai ko tēhea pea te tauira mararatanga ka taea.

I tō tuhinga me:

- whakaahua te Tauira Rohemaha me te Tauira "I Ahu Mai i Āwherika" (Tauira Whakakapi)
- whakamārama ko tēhea te tauira e tino tautokona ana e ngā whakaaturanga kua tukuna
- matapaki he pēhea pea te tautoko a te kunenga ahurea me te kunenga koiora i te mararatanga o te tangata onamata. (Kei roto i te kunenga koiora ko te whakaputa uri whakawhiti momo me te whiwhi i ngā ira whaitake.)

He wāhi anō mō tō tuhinga mō tēnei tūmahi kei ngā whārangi o muri mai.

ASSESSOR'S USE ONLY

Whole genome sequencing archaic interbreeding showing migration of *Homo sapiens*

https://aspergerhuman.files.wordpress.com/2015/06/nrg3625-f1.jpg

Helpful genes in hominin evolution

Gene	Function
FOXP2	Protein produced is helpful in transcribing regions in the brain used for language and speech.
SRGAP2	Gene helps to drive the development of the neocortex, which in humans is used for language and conscious thought.
HACNS1	Gene enhancer associated with limb development, especially the wrist and thumb in humans.
EPAS1	Of Denisovan origin and found in modern-day Tibetans. Allows increase in red blood cell production to cope with low oxygen found at high altitudes.
HLA	Neanderthals and Denisovans had this gene that helps white blood cells destroy micro-organisms that cause disease in our bodies.

Analyse the information provided and discuss how biological and cultural evolution assisted human dispersal. Evaluate which dispersal model is more likely.

In your answer you:

- describe the Multiregional Model and the Out of Africa Model (Replacement Model).
- explain which model is best supported by the evidence provided
- discuss how cultural evolution and biological evolution may have supported hominin dispersal. (Biological evolution includes interbreeding and the gaining of helpful genes.)

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

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

MĀ TE KAIMĀKA ANAKE

ASSESSOR'S USE ONLY

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

ASSESSOR'S USE ONLY

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

ASSESSOR'S USE ONLY

English translation of the wording on the front cover

Level 3 Biology, 2018

91606 Demonstrate understanding of trends in human evolution

2.00 p.m. Monday 19 November 2018
Credits: Four

91606M

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of trends in human evolution.	Demonstrate in-depth understanding of trends in human evolution.	Demonstrate comprehensive understanding of trends in human evolution.

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 and clearly number the question.

Check that this booklet has pages 2–27 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.