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

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91606M



916065

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



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Mana Tohu Mātauranga o Aotearoa
New Zealand Qualifications Authority

Te Mātai Koiora, Kaupae 3, 2024

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

Ngā whiwhinga: E whā

Paetae	Kaiaka	Kairangi
Te whakaatu māramatanga ki ngā ia i te kunenga tangata.	Te whakaatu māramatanga ki ngā ia i te kunenga tangata, kia hōhonu.	Te whakaatu māramatanga ki ngā ia i te kunenga tangata, 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 KATOAA 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 (///). Ka poroa aua wāhanga ka mākahia ana te pukapuka.

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

TE TŪMAHI TUATAHI: Te nekehanga o ngā makimaki me ngā tāngata

Ka kitea e te makimaki te nuinga o ā te makimaki kai i ngā rākau, nā reira he mea nui te mōhio o te makimaki ki te piki me te kimi kai i ngā wao e nōhia ana. Me rite hoki kia tawhiti te haere, tae atu ki te 5 kiromita i ia rā, i waenga i ngā wāhi kai. Nā runga i ēnei āhuatanga, he whānui ngā momo nekehanga o ngā makimaki, i ngā rākau, i te papa anō hoki. Ko te haere pekewhā me te hīkoi a ngā wae e rua ētahi o aua nekehanga. E ai ki ngā rangahau, e āhua rite ana te whakapaunga ngao o tā te makimaki haere pekewhā ki te hīkoi a ngā wae e rua. Ka tohu tēnei ōritetanga o te whakapaunga ngao i te korenga o ngā pānga o te hīkoi a ngā wae e rua ki te whakapaunga ngao a ngā tīpuna o mua.

Engari, nā te auau pea o te hīkoi a ngā wae e rua i panonihia ai te hope kia tōtika ake ai te tū; i rerekē ai hoki ngā waewae kia whāomo kē atu ai te hīkoi ina tawhiti te haere.



He makimaki me te punua.



He tangata nō nāianeī me te pēpi.

Matapakina ngā āhuatanga e whai pānga ana ki te nekehanga pekewhā, me te hīkoi a ngā wae e rua.

I tō tuhinga, me whai wāhi te matapakinga o:

- te tikanga o ngā kīanga nei: te auau o te hīkoi a ngā wae e rua me te noho ki ngā rākau, tae atu hoki ki ngā tautuhinga
- ngā take e rerekē nei ngā tāngata o nāianeī me ngā makimaki, me hāngai ki te āhua o te tuarā, te papatoiake, me te ahu whakatewaho o te turi
- te take e hīkoi ana ngā tāngata o nāianeī i ngā wae e rua, ahakoa kua kitea he mate i tēnei āhuatanga.

QUESTION ONE: Movement of hominids and hominins

Chimpanzees find most of their food in trees, so they need to be able to climb and forage for food in an arboreal environment. They also need to be able to cover long distances of up to 5 kilometres per day between food spots. As a result, chimpanzees have a wide range of types of movement, both in the trees and on the ground. These include quadrupedal and bipedal walking. Research has found that the energy cost of bipedal and quadrupedal walking in the chimpanzee is quite similar. This similarity in energy cost suggests that carrying out bipedal walking would have had no effect on the energy costs for early hominin ancestors.

Habitual bipedalism, however, may have favoured changes of the hip to allow a more upright posture and the changes to the lower limbs that allowed for more efficient walking over long distances.



Chimpanzee with baby.



Modern human with baby.

Discuss factors relevant to quadrupedal movement and bipedalism.

In your answer, include discussion of:

- the terms habitually bipedal and arboreal, including descriptions
- reasons for the differences between the modern human and the chimpanzee, related to the forms of the spine, pelvis, and valgus angle
- why modern humans are bipedal despite a named disadvantage of this characteristic.

TE TŪMAHI TUARUA: Tā ngā tāngata o nehe whakamahi i te weu

I hanga ngā tāngata o nehe (*Homo neanderthalensis*) i ngā taputapu maha. He maha ngā tauira o ā rātou taputapu kōhatu Levallois kua kitea. Tērā pea i whakamahia e rātou ngā matū, pērā i te rākau, i te weu rānei; engari, ka tere popo, kāore hoki e whakamātātokatia, nā reira kāore ērā e puritia ana.

Nō nā tata nei, ka kitea he taputapu kōhatu me ētahi taunaki o tā ngā tāngata o nehe whakamahi i te weu hiako kua whiria. He whiri io-3 te weu, ka mutu, he pērā i ērā o te whakaahua o raro iho nei te āhua o te whiringa o ngā weu. E whānui tonu ana te whakamahinga o tēnei tikanga hanga-aho i ēnei rā. Ko ngā weu kua whiria te pūtaka o te kākahu, o te taura, o te pēke, o te kupenga, o te whāriki, me te poti hoki - hui katoa, i te putanga rā anō, kua noho hei wāhanga matua mō ngā mahi o ia rā. E whakaatu mai ana ēnei taunaki o te māramatanga, me te whakamahinga o ngā weu kua whiria, i te wātea o te hangarau tuatini, he maha nei ōna wāhanga ki ngā tāngata o nehe, tae atu ki te mōhiotanga ā-pāngarau ki ngā takirua, ki ngā huinga me ngā tau.



He wāhanga nō te aho kua whiria, e miramira ana te hanga o te weu ki ngā tae.



Ka whakaū te io i te maha o ngā weu kua whiria.

Matapakina te āhua o ngā huanga o te whakamahinga o ngā weu kua whiria ki ngā tāngata o nehe.

I tō tuhinga, me whai wāhi te matapakinga o:

- te tikanga Levallois
- te wāhanga o te angaanga kua whanaketia, i kaha ake ai te mōhiotanga me te whakamahinga o ngā rautaki ā-pāngarau o te waihanga taura
- ngā whakamārama e RUA o tā ngā tāngata o nehe whakamahi pea i ngā taputapu, nā reira rā i piki ai te hauora o te tangata
- tētahi **ara** me tētahi **take** i puta ai te ihu o ngā tāngata o nehe i te āhuarangi makariri o Ūropi, nā runga i ngā huanga o te weu kua whiria hei kōhi kai.

QUESTION TWO: Neanderthal fibre use

Neanderthals (*Homo neanderthalensis*) made many tools. Numerous examples of their Levallois stone tools have been discovered. They may well have used other material such as wood or fibre; however, these break down easily and do not fossilise, so are not preserved.

Recently, a stone tool was discovered with evidence of Neanderthals having used twisted fibre made from bark. The fibre was a 3-ply cord, with the fibres arranged as shown in the image below. This method of cord-making is still in widespread use today. Twisted fibres provided the basis for clothing, rope, bags, nets, mats, and boats – all of which, once discovered, would have become important parts of daily life. This evidence of understanding and use of twisted fibres shows us that Neanderthals had use of complex, multi-component technology, as well as a mathematical understanding of pairs, sets, and numbers.



Fragment of twisted cord with the yarn structure highlighted in colour.



Ply confirms the number of yarns twisted together.

Discuss how the use of twisted fibres would have advantaged the Neanderthals.

In your answer, include discussion of:

- the Levallois technique
- the endocranial region that would have developed, allowing for the understanding and use of mathematical rope-making
- TWO explanations of how Neanderthal might have used tools, leading to an increase in health
- a reason **how** and a reason **why**, with the benefit of twisted fibre for food gathering, Neanderthals were able to succeed in the cold, European climate.

TE TŪMAHI TUATORU: Te moutere o Flores

Kua kitea ngā kōiwi o te *Homo floresiensis*, o tētahi o ngā momo tāngata o nehe kātahi anō ka kitea, i te moutere o Flores anake, i Initonīhia. Kei waenga i te 60 000 ki te 100 000 tau te tawhito o ngā mātātoka o te *H. floresiensis*, ā, kei te takiwā o te 50 000 ki te 190 000 tau te tawhito o ngā taputapu kōhatu i hangaia ai e tēnei momo tangata. I te takiwā o te 110 mitarau te tāroaroa o te *H. floresiensis*, i iti ngā roro, i nui ngā niho ina whakahāngaitia ki tō rātou iti, ā, i nui rawa atu ngā rekereke mō ngā waewae e pērā ana te poto. Ahakoa te iti o te tinana me ngā roro, i hangaia, i whakamahia hoki e te *H. floresiensis* ngā taputapu kōhatu, i arumia ngā arewhana iti me ngā kiore nui, i pareā hoki ngā konihi, pērā i te tarakona Komodo tino nui. E ai ki ngā taunaki o ēnei rā, kāore te *H. floresiensis* i tahu ahi; kua whakahāngaitia kētia ngā taunaki o mua mō te whakamahinga o te ahi ki ngā *Homo sapiens*.



Ko Flores - he moutere kei te mekemoutere o Initonīhia.



Ko tā tētahi ringatoi whakaahua o te *H. floresiensis* e tuki ana i tētahi tarakona Komodo.



E 85 kirokaramu te taumaha o te nuinga o ngā toa tarakona Komodo.

Matapakina ngā take i puta ai te ihu o te *H. floresiensis*. I tō tuhinga, me whai wāhi te matapakinga o:

- te āhua o tā tō rātou iti āwhina pea i te putanga o te ihu o te taupori i te moutere
- te putanga o te ihu o te *H. floresiensis*, ahakoa kāore i āta whakamahi i te ahi
- ngā take e RUA ka noho te tino whanaketanga o ngā roro hei huanga whiringa ki ngā momo tāngata o nehe.

QUESTION THREE: The island of Flores

Remains of one of the most recently discovered early human species, *Homo floresiensis*, have been found only on the island of Flores, Indonesia. The fossils of *H. floresiensis* date to between 60 000–100 000 years old, and stone tools made by this species date to between about 50 000–190 000 years old. *H. floresiensis* individuals stood approximately 110 cm tall, had small brains, large teeth for their small size, and relatively large feet for their short legs. Despite their small body and brain size, *H. floresiensis* made and used stone tools, hunted small elephants and large rodents, and coped with predators, such as the giant Komodo dragon. Recent evidence suggests that *H. floresiensis* did not use fire; previous evidence for the use of fire is now associated with the later *Homo sapiens*.



Flores, an island located in the Indonesian archipelago.



Artist's impression of *H. floresiensis* attacking a Komodo dragon.



Male Komodo dragons weigh 85 kilograms, on average.

Discuss reasons for the success of *H. floresiensis*. In your answer, include discussion of:

- how their small size might have enabled population success on the island
- the success of *H. floresiensis* despite not having controlled use of fire
- TWO reasons why substantial brain development would be a selective advantage to early hominin species.

He whārangi anō ki te hiahiatia.
Tuhia te tau tūmahi mēnā e hāngai ana.

TE TAU
TŪMAHI

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

[illegible]

**He whārangi anō ki te hiahiatia.
Tuhia te tau tūmahi mēnā e hāngai ana.**

TE TAU
TŪMAHI

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

[illegible]

Ngā Mihi

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

Te whārangi 2

<https://www.discoverwildlife.com/animal-facts/mammals/facts-about-chimpanzees>
<https://stock.adobe.com/453460915>

Te whārangi 6

<https://www.nature.com/articles/s41598-020-61839-w>
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1744&context=tsaconf>

Te whārangi 10

<https://www.komodoluxury.com/blog/flores-island-travel-guide/>
https://x.com/Extinct_Animals/status/1361733833230483461/photo/3
<https://www.ourbigjourney.com/komodo-island-land-of-the-komodo-dragon/>

Acknowledgements

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

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<https://www.discoverwildlife.com/animal-facts/mammals/facts-about-chimpanzees>
<https://stock.adobe.com/453460915>

Page 7

<https://www.nature.com/articles/s41598-020-61839-w>
<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1744&context=tsaconf>

Page 11

<https://www.komodoluxury.com/blog/flores-island-travel-guide/>
https://x.com/Extinct_Animals/status/1361733833230483461/photo/3
<https://www.ourbigjourney.com/komodo-island-land-of-the-komodo-dragon/>

English translation of the wording on the front cover

Level 3 Biology 2024

**91606M Demonstrate understanding of trends
in human evolution**

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.

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 (/////). 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.