91606

916060

3

SUPERVISOR'S USE ONLY

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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

Level 3 Biology, 2019

91606 Demonstrate understanding of trends in human evolution

2.00 p.m. Tuesday 12 November 2019
Credits: Four

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 2–16 in the correct order and that none of these pages is blank.

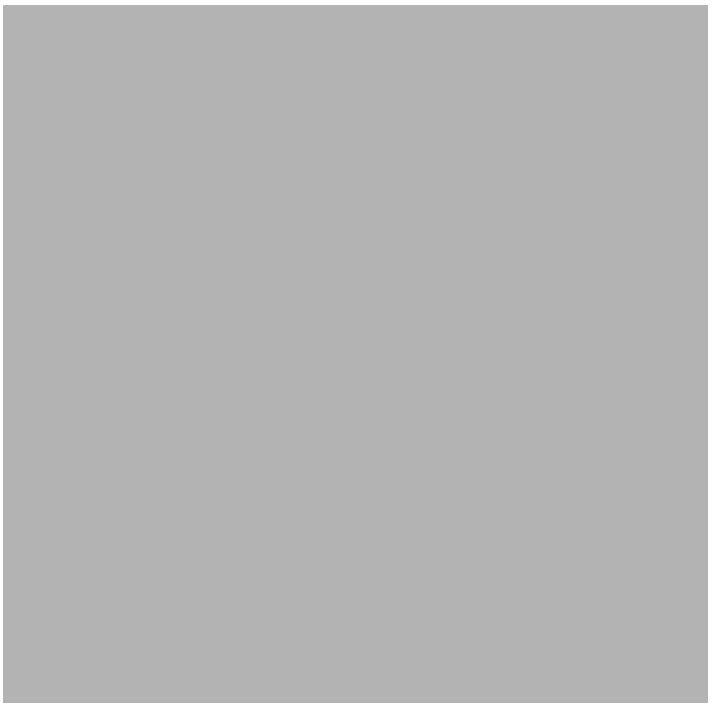
YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

ASSESSOR'S USE ONLY

QUESTION ONE

ASSESSOR'S USE ONLY



Adapted from: www.semanticscholar.org/paper/Evolution-The-Evolutionary-Path-to-Apes/2f5b0385464563072456ba2ce9615a6fb4ab2565/figure/12

The above diagram shows a chimpanzee on the left and an australopithecine on the right.

Discuss trends seen in the evolution of early hominins.

Include in your answer:

- a description of THREE of the following skeletal changes in the: foot, arm / leg ratio, spine, femur, pelvis shape, foramen magnum
- an explanation for TWO features of the advantage this change would provide the australopithecine when walking bipedally in Africa
- a discussion of possible selection factors that could have led to the changes seen.

ASSESSOR'S USE ONLY

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

ASSESSOR'S USE ONLY

This page has been deliberately left blank.
The examination continues on the following page.

QUESTION TWO

ASSESSOR'S USE ONLY

The Paleolithic period (the Old Stone Age) began approximately 2.6 million years ago. This was when we saw the first material evidence of early human technology.

Over the Paleolithic period there was a lot of development in tool cultures, which led to developments in clothing and food gathering ability.

Discuss changes to tool culture that came about in the Paleolithic period, and the advantages these changes could have brought to populations / species living at the time.

In your discussion:

- describe the difference between cultural evolution and biological evolution
- explain how TWO named tools / tool cultures could lead to a change in the lifespan in the population / species
- discuss how the changes to the tool culture could bring about change in clothing worn and success in hunting / gathering food.

ASSESSOR'S USE ONLY

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

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

QUESTION THREE

ASSESSOR'S USE ONLY

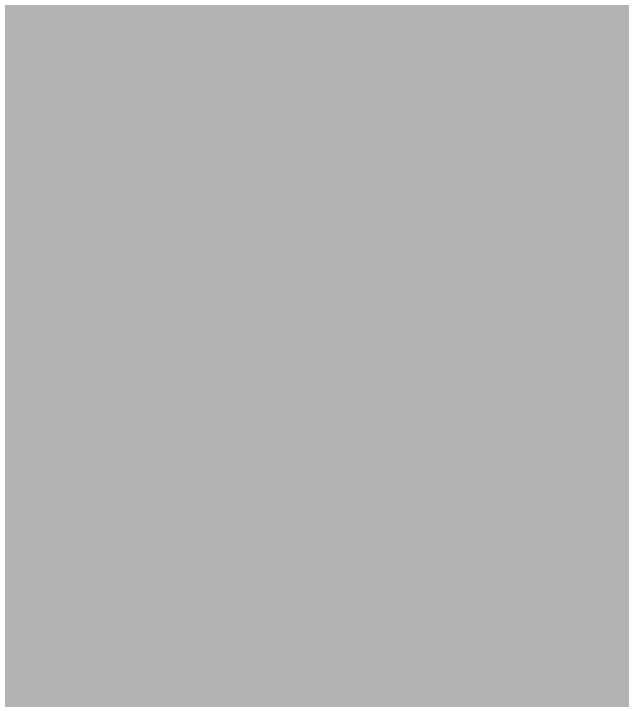
A new extinct species of human has been found in the Philippines. Fossils dated at 67 000 years ago are now attributed to belonging to *Homo luzonensis*, after the site of its discovery on the Philippines' largest island, Luzon. *Homo luzonensis* has some physical similarities to recent humans, but other features are closer to the australopithecines who lived in Africa between two and four million years ago, as well as very early members of the genus *Homo*.

That could mean primitive human relatives left Africa and made it all the way to South-East Asia, something not previously thought possible.

The find also shows that human evolution in the region may have involved three or more human species in the region at around the time our ancestors arrived.

One of these species was the diminutive (small) "Hobbit", *Homo floresiensis*, which survived on the Indonesian island of Flores until 50 000 years ago.

Fossils found include very small molars, and finger and toe bones. No DNA has been extracted due to the warm conditions in the area.



Geographx

Curved finger or toe bone of *H. luzonensis*.
www.bbc.com/news/science-environment-47873072

Discuss how the discovery of new species such as *Homo luzonensis* enables science to adjust the common understanding of the Out of Africa theory.

Include in your discussion:

- a description of the Out of Africa theory / replacement model
- an explanation of what knowledge mitochondrial DNA and nuclear DNA would provide scientists
- an explanation of named endocranial features, and how these features may have aided migration out of Africa.

ASSESSOR'S USE ONLY

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

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

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

QUESTION NUMBER

ASSESSOR'S USE ONLY

91606