For Supervisor's use only

3

90719

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 3 Biology, 2004

90719 Describe trends in human biological and cultural evolution

Credits: Three
9.30 am Thursday 25 November 2004

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 answer ALL the questions in this booklet.

If you need more space for any answer, use the page provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 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.

Achievement Criteria *For Assessor's use only*		
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe trends in human biological and cultural evolution. ☐	Explain trends in human biological and cultural evolution. ☐	Discuss trends in human biological and cultural evolution. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE: FOSSILS

Two fossil skulls found in different parts of Africa were dated as being 2 million years old. One was classified as the genus *Paranthropus* and the other as the genus *Homo.*

(a) Scientists know that both of these types of hominids walked upright. Describe how scientists could tell from fossil skulls that these hominids walked upright.

(b) Features of the skulls identify which genus each belongs to. Describe a feature of these skulls and explain how it differs in the skulls, allowing them to be classified in their appropriate genus.

(c) Hominids developed stone tools. Describe how changes in stone tools showed that the genus *Homo* became more dextrous over time.

QUESTION TWO: CHANGES OBSERVED

Assessor's use only

(a) The feet of living apes and humans differ. Explain how the feet of one of the living apes would differ from the feet of a present-day human, in relation to their locomotion.

(b) Modern humans have a brain volume three times larger than that predicted for an average ape with our body size. Use the following diagram to help you answer the questions that follow.

adapted from Roger Lewin, *Human Evolution*, Blackwell Scientific Publications, 1993.

(i) The Australopithecines did not have Broca's and Wernicke's areas developed in the brain. However *Homo habilis* had Broca's area developed, and *Homo erectus* and *Homo sapiens* had both areas developed. Explain why these two areas of the brain were developed in this sequence of hominids.

Assessor's use only

(ii) Discuss the trends in brain development shown by the **Hominid Trend** in the diagram on the previous page and link tool technology to development and other aspects of biological and cultural evolution.

Assessor's use only

(iii) *Homo erectus* is the first recognised user of fire. Describe a benefit of fire to these hominids.

QUESTION THREE: WHERE HUMANS ORIGINATED

Assessor's use only

An analysis of gene sequences found in mitochondria strongly supports one of the theories about the dispersal of humans (genus *Homo*). The mitochondrial DNA evidence suggests the following:

[For copyright reasons, this resource cannot be reproduced here. See below.]

Source: *The Washington Post*

Compare and contrast the two main theories about the dispersal of humans (genus *Homo*) in the world and relate each of the theories to the information shown in the diagram. You may draw other diagrams to help your comparison.

Assessor's use only

Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question number