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MANA TOHU MĀTAURANGA O AOTEAROA

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# Level 3 Biology, 2012

## 90719 Describe trends in human evolution

2.00 pm Tuesday 13 November 2012
Credits: Three

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 2–8 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.**

| ASSESSOR'S USE ONLY | Achievement Criteria | | | | | |
|---|---|---|---|---|---|---|
| **Achievement** | | **Achievement with Merit** | | **Achievement with Excellence** | | |
| Describe trends in human evolution. | ☐ | Explain trends in human evolution. | ☐ | Discuss trends in human evolution. | ☐ | |
| **Overall level of performance** | ☐ | | | | | |

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You are advised to spend 40 minutes answering the questions in this booklet.

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## QUESTION ONE

Fossil skulls can provide insight into many aspects of earlier hominins. Three examples of hominin skulls are shown below.

| *Paranthropus robustus (Australopithecus robustus)* | *Homo neanderthalensis* | *Homo sapiens* |
|---|---|---|
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| www.boneclones.com/images/bh-003-lg.jpg | www.boneclones.com/images/bh-019-lg.jpg | www.oocities.org/palaeoanthropology/sapiensmodern.gif |

Discuss the features of the three **skulls** and **endocranial features**.

In your answer you should include:

- distinguishing features of the three **skulls** shown
- how **skull** features can indicate the species' way of life, including diet and aspects of their cultures
- the **endocranial features** of *Homo sapiens* that allowed them to be more successful.

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## QUESTION TWO

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There is disagreement about exactly when fire was discovered and then controlled by hominins. However, it is widely accepted that *Homo erectus* used fire, perhaps controlling it in some form towards the end of its time. Later species, *H. sapiens* and *H. neanderthalensis*, are both believed to have used fire routinely.

Discuss the impact of fire on the evolution of hominins.

In your answer you should include:

- the uses of fire
- how fire may have affected cultural evolution
- how these changes in cultural evolution may have affected biological evolution.

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## QUESTION THREE

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A number of theories of human dispersal exist. Two models of the theories can be summarised as shown in the diagrams below left and centre.

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In 2010, DNA sequencing of Neanderthal specimens indicated that they share as much as 4% more of their genome with non-Africans than with Africans. Also in 2010, an extinct hominin (called Denisovans) was found to share 4–6% of its genome with living humans from Melanesia, and with no other living group.

In 2011 y-chromosomal analysis indicated that all living males have descended from an ancestor that lived around 60 000 to 140 000 years ago (in Africa).

Discuss how well the 2010 and 2011 evidence supports the theories of human dispersal shown above.

In your answer you should:

- describe the "Out of Africa" and "Multiregional" theories
- explain what the 2010 and 2011 evidence indicates about early human dispersal
- discuss how the 2010 and 2011 evidence supports (or otherwise) the theories shown in the diagram above.

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

QUESTION NUMBER

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