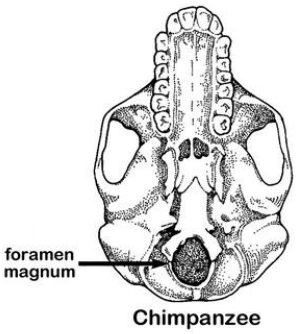
AS 91606 Demonstrate understanding of trends in human evolution

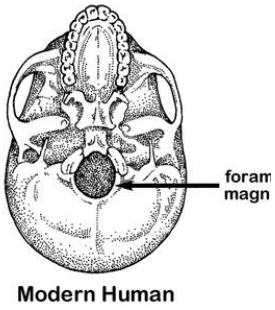
Biological Evolution

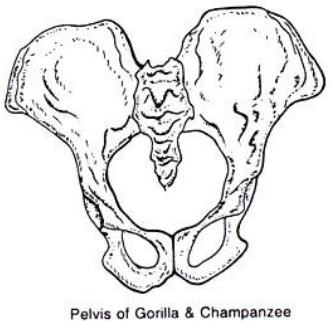
(2015, 1)

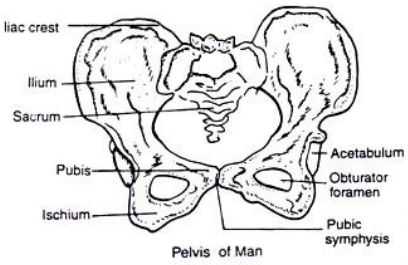
A distinguishing feature of hominins is habitual bipedalism. Comparisons of skeletal features of modern humans and extant (living) hominids such as the gorilla or chimpanzee, reveal several key features that are associated with the transition from quadrupedal species to bipedal species.

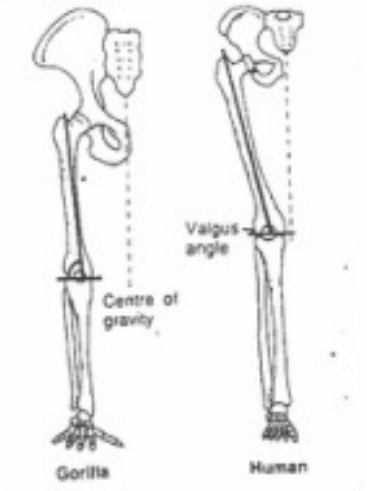
Some of the most important features are shown below.

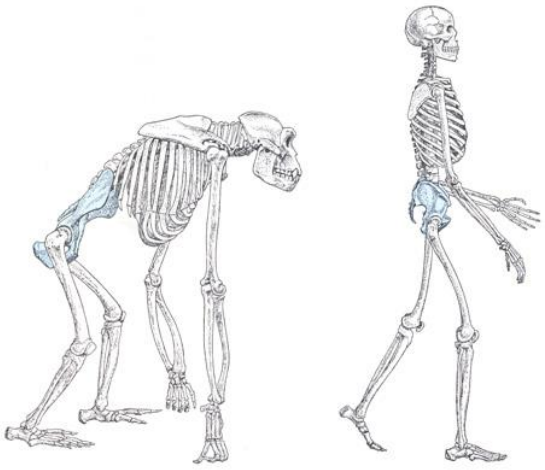












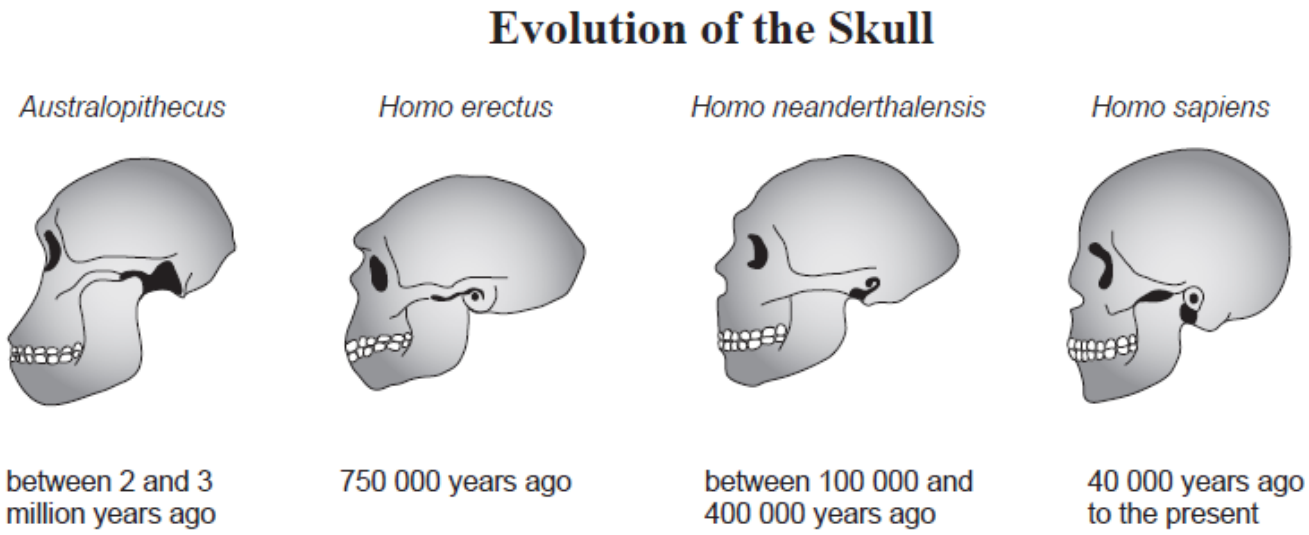
Discuss the importance of bipedalism in the development of hominins by linking the skeletal features to their adaptive significance.

In your answer:

- describe what is meant by the terms quadruped and biped
- explain how any three of the skeletal features (shown above) provide evidence for the form of locomotion changing to bipedalism
- justify why bipedalism was so significant to the evolution of hominins.

(2014, 1)

Recent evidence indicates that a single gene mutation resulting in weakened jaw muscles may have been significant in the early evolution of hominins around 2.4 million years ago, as changes to muscle anatomy can also alter the bones to which they attach.

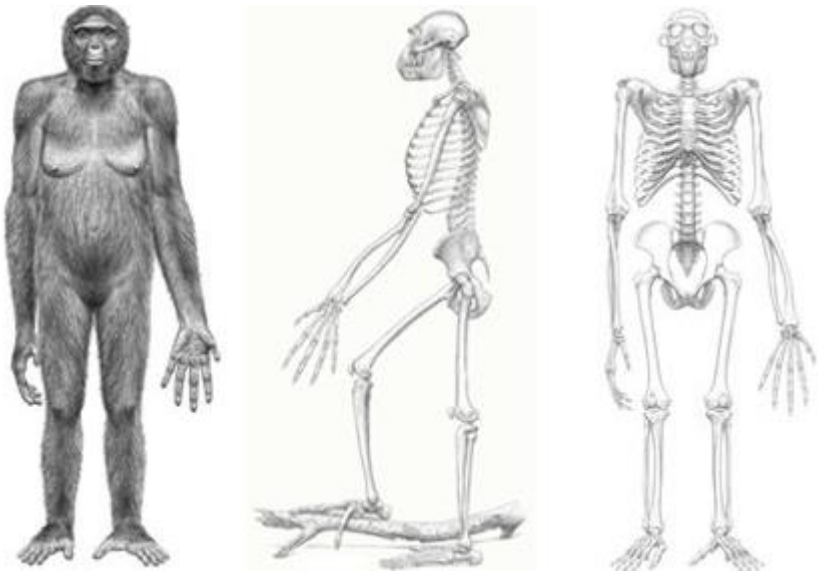


Relate the significance of weakened jaw muscles and changes in skull structure to human biological evolution.

In your answer:

- describe the changes in skull structure that occurred
- explain how a change in jaw muscle anatomy may have influenced changes to skull structure
- evaluate the implications of the changes in skull structure to further human biological evolution in terms of the brain.

(2013, 1)



Long before any hominin fossils were ever found, it had been predicted that walking upright must have happened **before** other biological changes, such as brain increase and manipulative ability of the hand.

There is not general agreement on what caused bipedalism to develop in early hominins, but one theory is that environmental change played a critical role.

Discuss how bipedalism may have developed and resulted in further biological evolution in early hominins.

In your answer:

- describe the changes in the skeleton, hand, and brain due to bipedalism
- explain why bipedalism was selected for in the environment of early hominins
- justify, with reasons, why brain developments and manipulative ability of the hand would have occurred **after** bipedalism.

The questions below are from the now expired AS 90719 Describe trends in human evolution.

http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/biology/expired-standards/
However they may still be useful for AS 91606 Demonstrate understanding of trends in human evolution

(2012, 1)

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

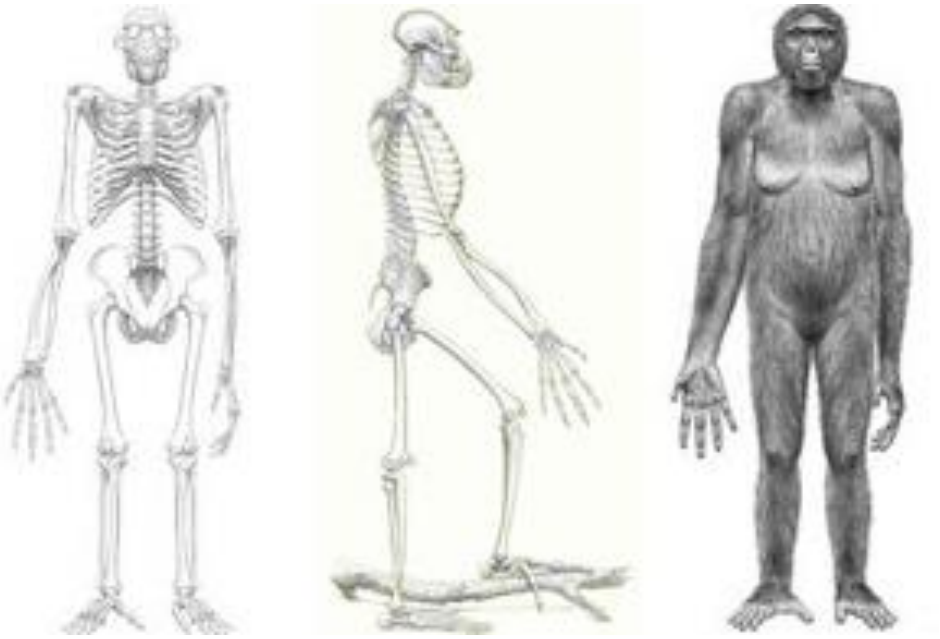
Discuss the features of the three **skulls** and **endocranial features**.

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.

(2011, 1)

The diagrams below show *Ardipithecus ramidus* ("Ardi"), believed to be an early ancestral hominin, who lived about 4.5 million years ago. At this time the climate in the area where she lived was drying, reducing vast forests to scattered pockets of woodland.



(a) Explain how the skeletal evidence indicates that Ardi spent significant amounts of time on the ground **bipedally** as well as in trees (**arboreal**).

(b) Discuss the possible survival advantages and disadvantages Ardi would have had due to being bipedal.

You should consider:

- key biological changes
- suitability for her niche
- the changing climate.