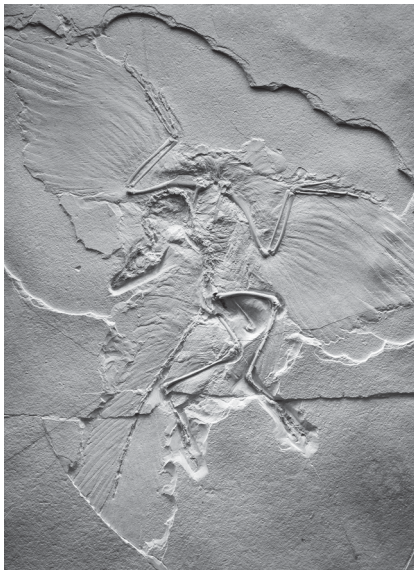


**GCSE Biology B (Twenty First Century Science)**  
**J257/02** Depth in Biology (Foundation)

**Question Set 9**

1 (a) Fossils provide evidence for evolution.

A fossil of an extinct animal called *Archaeopteryx* was discovered in 1861. A photo of the fossil is shown in **Fig. 1.1**.



**Fig.1.1**

*Archaeopteryx* has:

- wings and feathers, like a bird
- teeth and three fingers with claws, like many dinosaurs.

(i) How does the *Archaeopteryx* fossil provide evidence that birds evolved from dinosaurs?

Tick (✓) **one** box.

It has features of both birds and dinosaurs.

It is now extinct.

It is part of the fossil record.

It shows natural selection.

[1]

(ii) Twelve fossils of *Archaeopteryx* have been found.

The twelve *Archaeopteryx* fossil animals vary in appearance.

Suggest what could have caused these differences in appearance.

[2]

Mutations in individuals, which causes them to have different characteristics. The genetic variation can also be caused by new combination of genes after sexual reproduction.

(b) Read the article.

### Early humans on Flores

A population of early humans became trapped on an island called Flores 100 000 years ago.

The average height of these early humans was 1.79 m. Their maximum body mass was 68 kg.

There was a very limited amount of food on the island.

Small human skeletons found on the island show that by 50 000 years ago:

- the average height of the humans on Flores had decreased to about 1 m
- the maximum body mass had decreased to 25 kg.

(i) Explain how **natural selection** caused the humans on the island to become smaller over many generations. [5]

a random mutation would have occurred where an individual was smaller and lighter. This would have meant that they could survive with less food, and given the the scarcity of food in the area, they are more likely to survive until adulthood and reproduce, passing on their favourable characteristics to the next generation. This process continues over time, and more and more individuals display a smaller, lighter figure.

(ii) Some scientists think the small Flores humans from 50 000 years ago should be classified as a different species of humans.

Suggest why they could be classified as a different species. [2]

The appearance of the two groups is so different and their DNA could be very different as they were isolated for a very long time (50 000 years). They may not be able to interbreed to produce fertile offspring.

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