

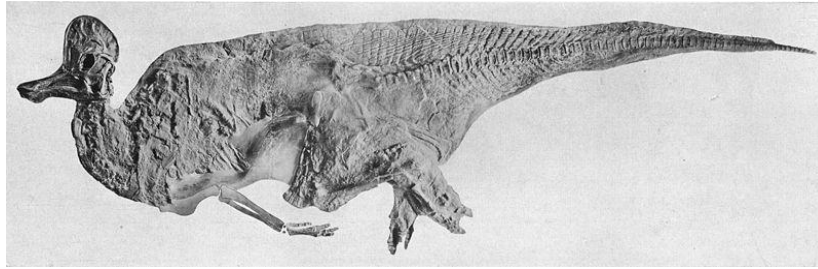
BIOLOGY

Biology Assignment – Life on Earth

1. A fossil is any impression that indicates the existence of past life. Fossil findings are very rare, as specific conditions are required for fossilization, but when a fossil is found, it is recorded and analyzed by scientists. The fossil record is the collective gathering of fossils all around the world; of which when viewed as a whole provide information about evolution on Earth. By placing fossils in order from oldest to youngest, we are able to distinguish patterns and similarities, hence providing evidence for the concept of evolution. The fossil record provides a historical knowledge of life on Earth since it is the remains of the past, and as it is placed in order of age, we can put together Earth's history into a timeline of periods.
2.
 - (a) People have been uncovering fossils for at least 30 000 years. In the early stages, fossils were not well understood. Many myths came about from these artifacts. A lot of cultures in ancient times believed them to be possessing magical powers. A popular theory in the medieval times was that the Earth and its own "creative forces" were trying to make copies of living things. It was not until the late 18th century that fossils and extinction were linked together. The discovery of the remains of gigantic creatures unlikely to exist on Earth (such as the mastodon) started the theory that these were in fact the remains of extinct creatures. These days we understand fossils a lot more. The modern use of technology has enabled us to gain a much more extensive knowledge of fossils. E.g. the carbon 14 method gives an exact date of a fossil, letting us know how long ago it lived. The electron microscope has enabled us to see minuscule detail, making it possible for us to find differences and similarities in cell structures.
 - (b) In the early 19th century, the concept of evolution was very unpopular as it contradicted religion. Before the proper analysis of fossils, people believed life began on Earth by spontaneous generation, where life forms 'spontaneously generated' from non-living matter. Charles Darwin was the first man to make the idea of evolution respectable to the public by gathering enough evidence. Evidence came from fossils as well as living things. One important piece of evidence was the appearance of the same basic bone pattern in the limbs of all mammals. Such similarities show that they must all be descended from one common ancestor. Now we know that Earth started with very basic life forms such as eukaryotes, which then evolved into more complex organisms such as humans.
3.
 - (a)

Name	Corythosaurus
Description	Comes from the family of Hadrosauridae also known as the duck-billed dinosaur due to its duck-like, flat snout. Corythosaurus was a herbivore and had a hollow bony crest on top of its head. It stood about 2.75m and was as long as 10m.
Age	Towards the end of the Cretaceous period – 77 to 76.5 million years ago
Where Found	North America

Diagram:



Name	Cordaite
Description	Comes from the class of Gymnosperms which grew on wet ground. Cordaite was a tree – like plant that grew up to 30m and had long strap-shaped leaves with multiple parallel veins. Leaves were generally thick and leathery. They produced seeds as large as 10mm.
Age	Upper Carboniferous period – 318 to 299 million years ago
Where Found	Rock sections of the Dutch, Belgian and German coal areas

Diagram:



(b) **Extinct: Diprotodon**

The Diprotodon was one of Australia’s megafaunas. It was about 3m in length and stood 2m from the shoulder. They were about the size of a rhinoceros and weighed up to 2,786kg. Their diet consisted of leaves, shrubs and some grasses. Female skeletons have been found with babies located where the mother’s pouch would have been, proving they were marsupials.



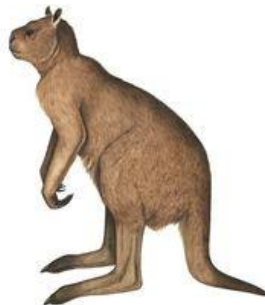
Current: Wombat

The wombat is also a marsupial. They have a herbivorous diet like the Diprotodon, but due to its height, their food is found closer to the ground such as grasses, herbs, bark and roots. Unlike the Diprotodon, their size is only about 1m in length and weigh 25-30kg with a short and stubby build. Their legs are much smaller in proportion to their body than Diprotodons.



Extinct: Procoptodon

The Procoptodon is another example of Australian megafauna. It was a marsupial, approximately 2m tall and weighed about 230kg. They stood on two legs and had a single large toe on each foot. Their face had a flattened look with forwardly-directed eyes. Each front paw had two long, clawed fingers. It was a browser, meaning they mainly feed on leaves.



Current: Kangaroo

The kangaroo is also a marsupial. Only large, male red kangaroos reach roughly the height of the Procoptodon, otherwise most kangaroo species are considerably smaller, with a weight range from 90kg to 50kg. Kangaroos also stand on two legs yet the number of toes on each foot has increased to four. Their front paws have five relatively equal sized, clawed fingers. Unlike the Procoptodon, their face is elongated and has peripheral vision. Kangaroos are grazers, mainly feeding on grass.



4. (a) Biodiversity: is the wide range of different organisms, existing around the world.
Micro-flora: are microscopic plants such as bacteria, fungi, algae protozoa and viruses.
Natural selection: is the increased chance of an organism passing on its genetics to the next generation due to characteristics/features that benefit its chances of survival. The weaker organisms die off and hence through time, an 'improved' species is formed.
- (b) 3 topics from the article:
- Eukaryotes – discussed as being the ancestors of complex plants and animals alive today which unlike bacteria have a nucleus
- The evolution of organisms – the theory that these early life forms (eukaryotes) evolved into more complex life forms, being the ancestors of plants and animals today.
- Fossilization – the recovery of a fossil from hundreds of meters underground, where it is described as being in almost perfect condition.
- (c) The main idea the author is trying to communicate to us is that the discovery of 10 new species of 1,500 million year old plankton could be the basis of life on Earth today. If they were different, the process of evolution would've been different; hence a totally different life form would exist today. Also as the fossils are in almost perfect condition, they would be all the more valuable as more clues can be provided.
- (d) The scientific journal in this article is called "Nature", where the Australian scientist, Professor Malcolm Walter of Macquarie University's Australian Centre for Astro-biology, announced the discovery of 10 new prehistoric plankton species along with his colleagues. The journal report would have used more scientific terminology than the newspaper article. The newspaper article could also have been written in a way to make it sound more 'interesting' or understandable to the level of the general public. The possibility of biased information is also possible in newspapers.