

BW 3. Outline evolution by natural selection and how it explains the diversity of living things.

Natural selection is the process by which species adapt to their environment.

A mutation or variation occurs. If the variation is beneficial, the animal will survive longer and reproduce more. Some of its offspring will inherit the variation. These offspring will also have better chance of survival, meaning they live longer and reproduce more

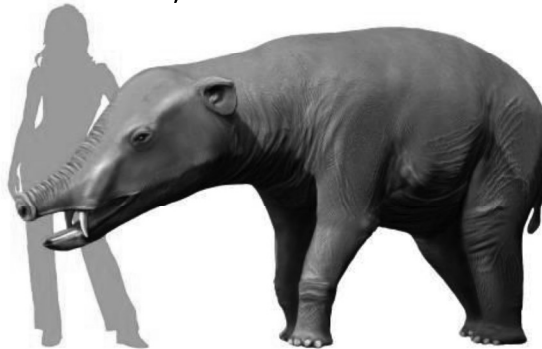
Evolution is a theory proposed by Charles Darwin in 1858. It is described as the changing of one species into another that takes place through natural selection over a long period of time

1: Fill in the blanks using the following words:

evolution environment generation mutate survive variation

Individual organisms of a species may show a wide range of _____ because of differences in their genes. Individuals with characteristics most suited to the _____ are more likely to _____ and reproduce successfully. The genes that have helped these individuals to survive are then passed on to the next _____ . This is known as natural selection.

2: The image below shows Phiomia, an ancestor of modern elephants.



via Wikimedia commons

Phiomia lived about 35 million years ago. Both Phiomia and modern elephants reach up into trees to get leaves.

Use Darwin's theory of natural selection to explain how the elephant's trunk evolved.

Before the theory of evolution and natural selection, people had other ideas about how all living things formed. Briefly explain this idea.

3. The picture below shows two different species of butterfly.

Both species can be eaten by most birds however Monarch has an unpleasant taste which birds do not like, so birds have learned not to prey on it. Viceroy on the other hand has a pleasant taste but most birds do not prey on it.

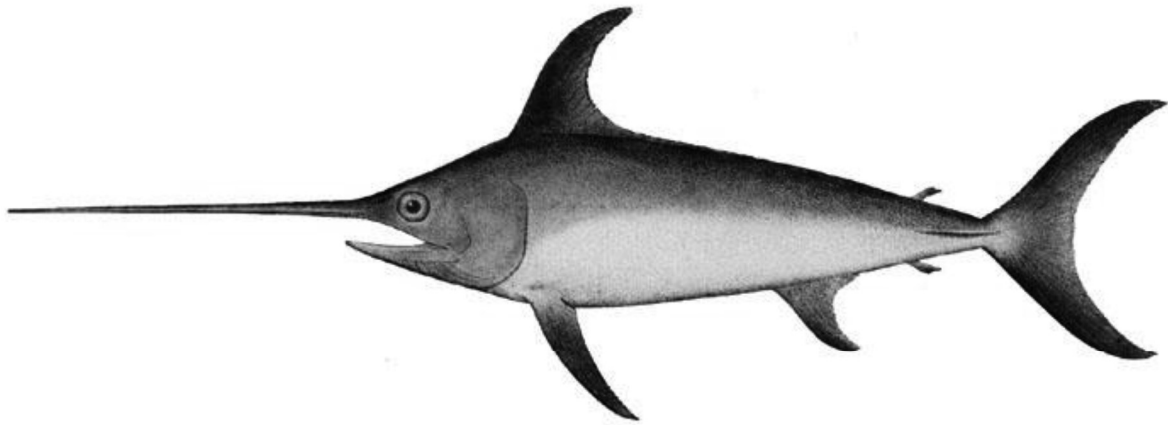


via Wikimedia commons

a. Why do most birds not prey on Viceroy even though it has a pleasant taste?

b. Suggest an explanation, in terms of natural selection, how the markings on both species of butterfly are so similar even though they are different species?

4. The picture below shows a modern swordfish.



via Wikimedia commons

Swordfish use their swords to injure prey. The injured prey are easier to catch. Ancestors of swordfish had short swords as seen in the fossils found. Modern swordfish have much longer swords.

Charles Darwin suggested that evolution is a result of natural selection. Describe how natural selection could result in modern swordfish with long swords developing from ancestors with short swords.

Fossils provide evidence for evolution. What is a fossil?

5. Many humans use selective breeding to produce animals with specific characteristics or variations.

Dogs for example, can be selectively bred to be allergy friendly. The allergy is caused by dander (shedding skin particles) and hair. Selectively breeding dogs which have low dander and do not shed hair over generations has produced dog breeds which are allergy friendly so they do not cause an allergic reaction to humans who suffer from dog allergies. For example the Australian Labradoodle which is a combination of a Labrador and a poodle.



Explain how the dog has been produced using selective breeding:

Suggest two other reasons why people might selectively breed dogs.

1: _____

2: _____

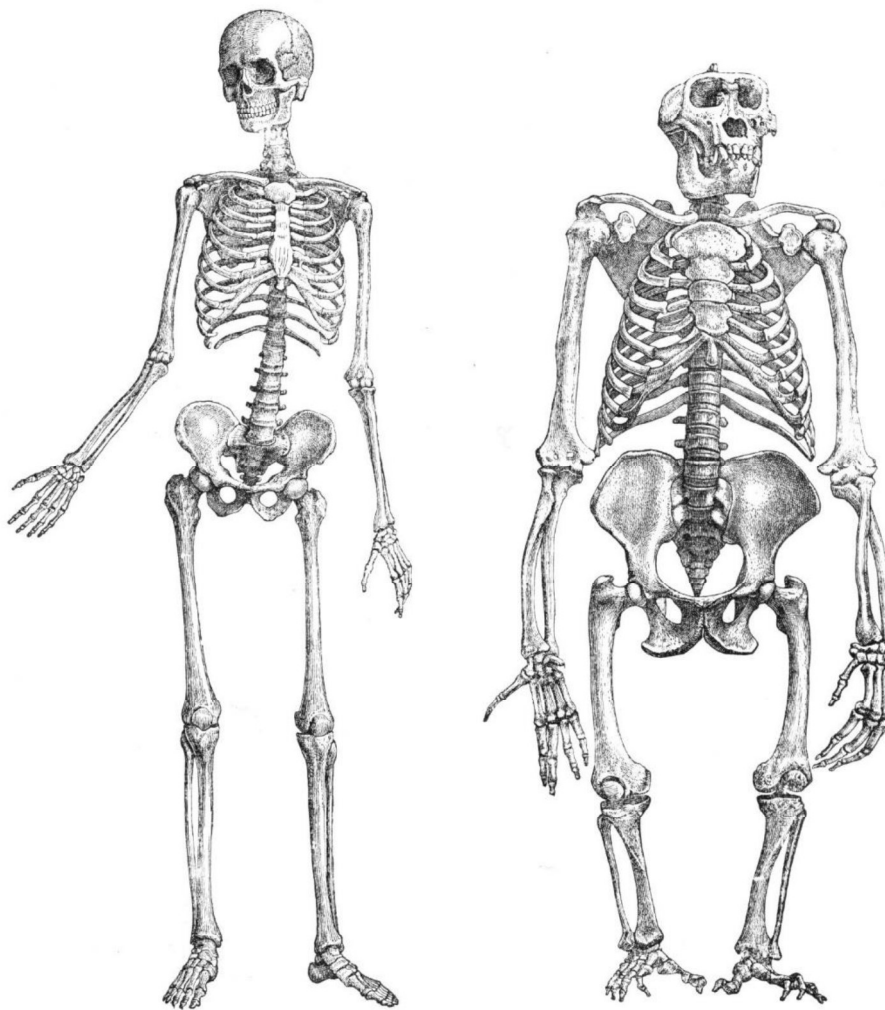
Selective breeding could cause problems of inbreeding in dogs. Describe one problem inbreeding causes.

Name another animal which humans selectively bred and state the characteristic/variation they are looking for.

Animal: _____

Characteristic: _____

6. The diagram shows the skeleton of a Human and Chimpanzee:



Via Wikimedia commons

a) What evidence is there in the diagram that a human and chimpanzee share a common ancestor?
