

Definitions:

- Artificial selection is the selection of animals to breed based on having desirable
- Natural selection is The process which drives evolution, the best adapted organisms survive to
- Adaptations are Specific features which give an advantage to an organism, in terms of

Evolution is

The gradual change in heritable characteristics of a species over

The evidence from the fossil record shows that

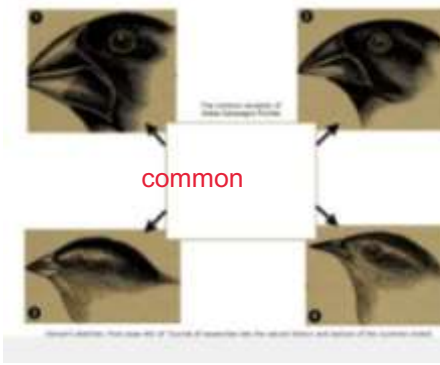
There are species which have become extinct, which show this gradual change of

Homologous structures provide evidence that

Several species share a common ancestor and that the shared feature changed gradually in slightly



Divergent evolution in Finches



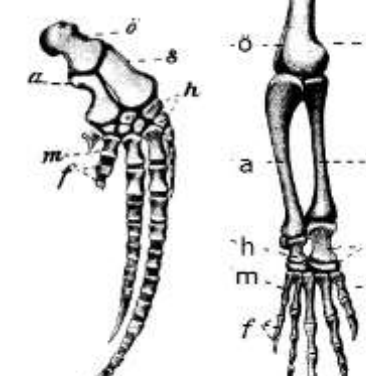
How does divergent evolution occur?

- Two populations become
- In each location there is a different selection pressure. The characteristics of the 'fittest' animal in each place is slightly different
- So natural selection causes the characteristics of each population to be increasingly different

Compare the pentadactyl limbs in the diagram on the right

dolphin	monkey
One femur (upper	one upper limb
two shorter lower limb	two longer lower limb
several wrist	several wrist
five 'finger' bones - two	Five almost equal length 'finger'

Pentadactyl limbs of a dolphin & monkey



Explain selection pressure.

This can be stabilizing, directional or disruptive  
E.g. stabilizing, human birth weight, too big birth is difficult, baby or mother can die, too small and the baby might not be strong enough to feed and survive. Best adapted tend to be close to the centre.  
Directional selection can lead to a species developing

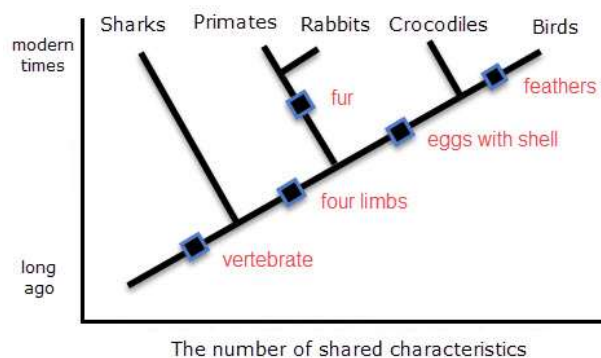


Domai Classification taxa = K Kingdo, P Phylu, C Clas, O Ord, F Famil, G Genu, s specie  
 Plant phyla: Bryophyte, Filicinophyte, Coniferophyte, Angiospermophyte,  
 Animal phyla: Poripher, Cnidari, Arthropod, Annelid, Platyhelminth, Chordat,  
 Animal groups in the Chordata phylum: B Bird M Mammal A Amphibian R Reptile F Fis  
 The three domains of living things are: Archaeobacteri Eubacteri Eukaryote

Features of plants (all groups required)

Phylum	Main features
Bryophyta	simple leaves no vascular
Filicinophyta	Fonds, vascular tissue
Coniferophyta	vascular tissue, needles
Angiospermophyta	Vascular tissue, flowers

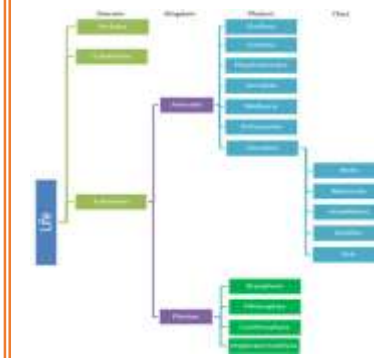
A cladogram



Analysis of evolutionary relationships using a cladogram

Using the cladogram on the left identify the closest relative of the crocodiles  
Birds are the closest relative to crocodiles, using the  
 Suggest whether the last common ancestor of primates and crocs had four limbs  
Yes, four limbs occurred before the branch between the primates and the  
 Explain how the diagram shows the approximate date of the last common ancestor of two species  
The most recent branches are closer to today in  
The postion of the branch on the vertical scale gives an indication of the approximate

Classification groups in a cladogram



Evidence from cladistics (DNA analysis in particular) has caused reclassification of some groups. Explain why.  
classification has traditionally be based on visible features.  
Modern genetic techniques have make DNA analysis much easier. This is a more precise method to measure relatedness of two species.  
Sometimes physical features look similar but are the result of quite different genetics.

