

Vertebrate Zoology Cladistics Project

Cladistics is a branch of biology which shows the evolution of species with shared derived characteristics. You will be creating a phylogenetic tree showing the development of vertebrates into the complex morphological and diverse creatures which exist today on land and in the water. Branches on the phylogenetic tree should include major character dichotomies. Phylogenetic characters are:

1. Amniotic egg
2. Anapsid skull
3. Antlers
4. Autotomy
5. Body covering (e.g. scales, feathers, skin)
6. Carapace & plastron
7. Cartilaginous skeleton
8. Cloaca
9. Counter current heat exchanger
10. Crop & Gizzard
11. Diaphragm
12. Diapsid skull
13. Double circulation
14. External fertilization
15. Furcula
16. Four chambered heart
17. Gills
18. Hair
19. Heterodont or homodont
20. Hibernation
21. Homeothermy
22. Horns
23. Internal fertilization
24. Jacobson's organ
25. Jaws
26. Keratin
27. Nitrogen excretion (ammonia, urea, & uric acid)
28. Lungs
29. Mammary glands & milk production
30. Operculum
31. Ossified skeleton
32. Oviparous
33. Paired appendages
34. Placenta
35. Poikilothermic
36. Synapsid skull
37. Swim bladder
38. Three chambered heart
39. Two chambered heart
40. Viviparous

Vertebrates to include

- Artiodactyls
- Birds
- Crocodiles
- Frogs
- Hagfish
- Lampreys
- Lizards
- Lobe finned fish
- Lung fish
- Mammals
- Marsupials
- Monotremes
- Perissodactyls
- Ray finned fish
- Rays & Skates
- Salamanders
- Sharks
- Snakes
- Turtles

Grade will be derived as follows:

300 points - All phylogenetic characters are correctly displayed in a phylogenetic tree

300 points - All phylogenetic dichotomies explain evolutionary advantage

100 points - Diagrams included for 10 or more characters

100 points - Project is neatly completed in color on a three way presentation poster-board

The phylogeny principle of classification is an evolutionary principle. It classifies species according to how recently they share a common ancestor.

Two species that share a more recent common ancestor will be put in a group at a lower level than two species sharing a more distant common ancestor. As the common ancestor of two species becomes more and more distant, they are grouped further and further apart in the classification. In the end, all species are contained in the category the set of all living things which contains all the descendants of the most distant common ancestor of life.



