

Ministry of Higher Education
and Scientific Research
University of Ishik
College of education
Department of Biology

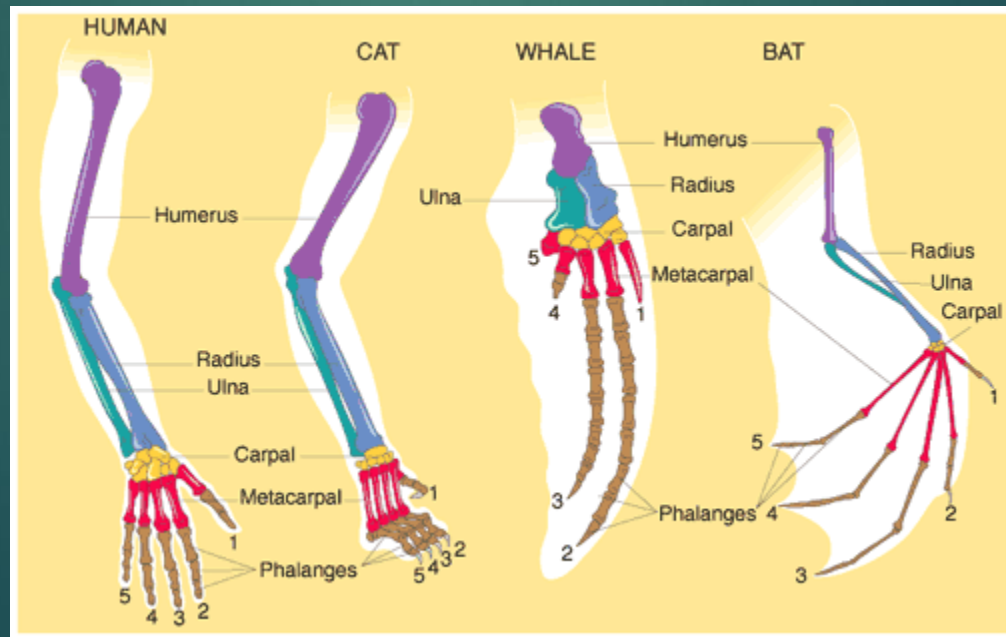


Practical comparative anatomy
Grade four (2018-2019)
1st Lab.

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Comparative anatomy : is the study of similarities and differences in the **anatomy** of different **biology** and **phylogeny** . species. It is closely related to evolutionary





What is the importance of comparative anatomy ???

Comparative anatomy is an **important** tool that helps determine evolutionary relationships between organisms and whether or not they share common ancestors. However, it is also **important** evidence for evolution. **Anatomical** similarities between organisms support the idea that these organisms evolved from a common ancestor.




studying, cataloguing and maintaining biodiversity is of prime **importance**, because it allows biologists to better understand conservation issues and the consequences that follow from the loss of species.

Thomas Huxley 1825-1895

Published Comparative Anatomy of Vertebrates in 1871. established the modern concept of the evolution of the vertebrate skull.





the arrangement of animals and plants in taxonomic groups according to their observed similarities (including at least **kingdom and phylum in animals, division in plants, and class, order, family, genus, and species**).

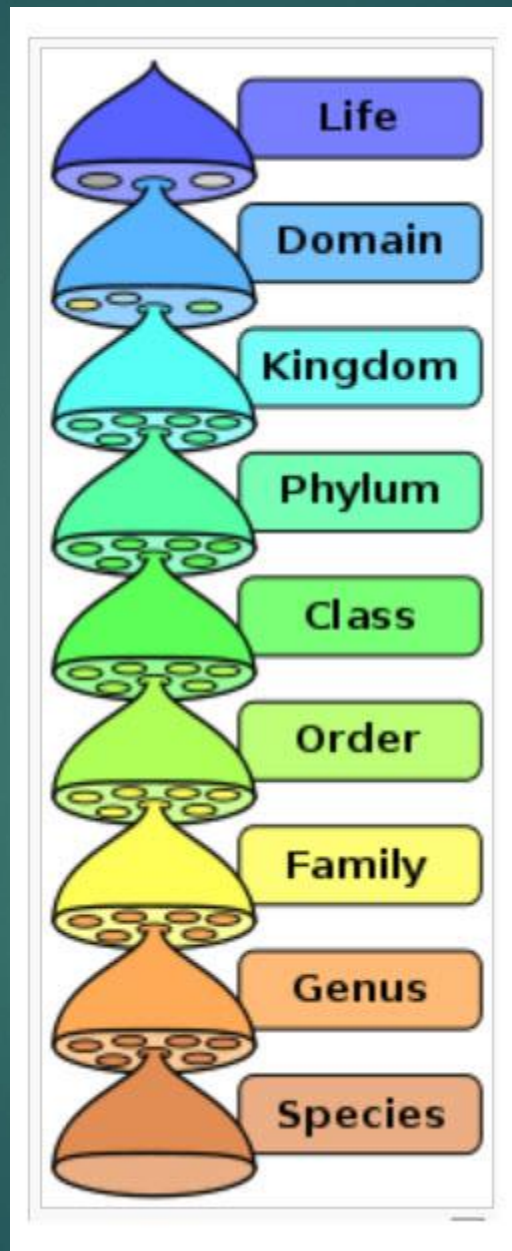


The **advantages of classifying** organisms are as follows:

(i) **Classification facilitates** the identification of organisms.

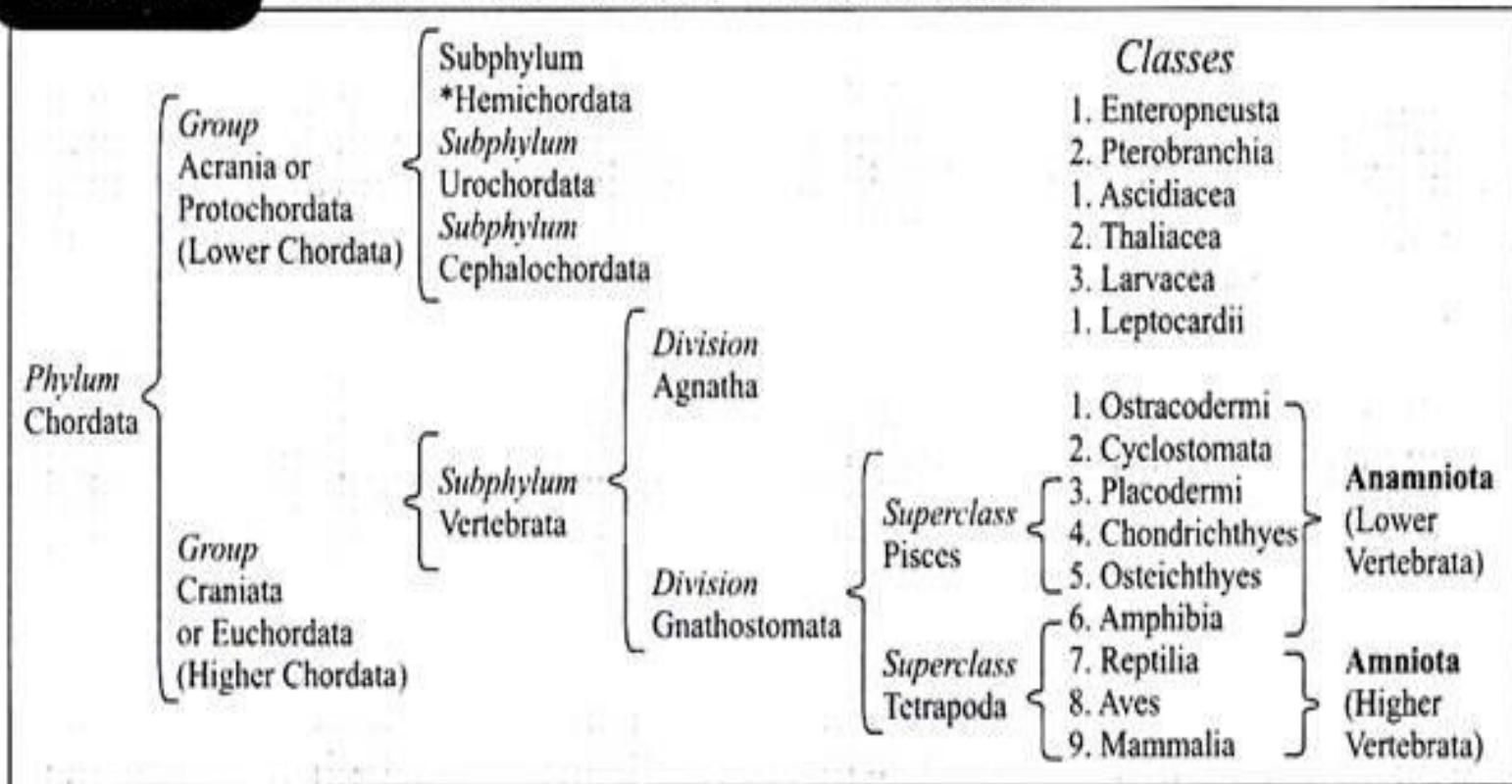
(ii) helps to establish the relationship among various groups of organisms.

(iii) helps to study the phylogeny and evolutionary history of organisms.



Phylum: Chordates

TABLE 1.2. OUTLINE CLASSIFICATION OF PHYLUM CHORDATA.

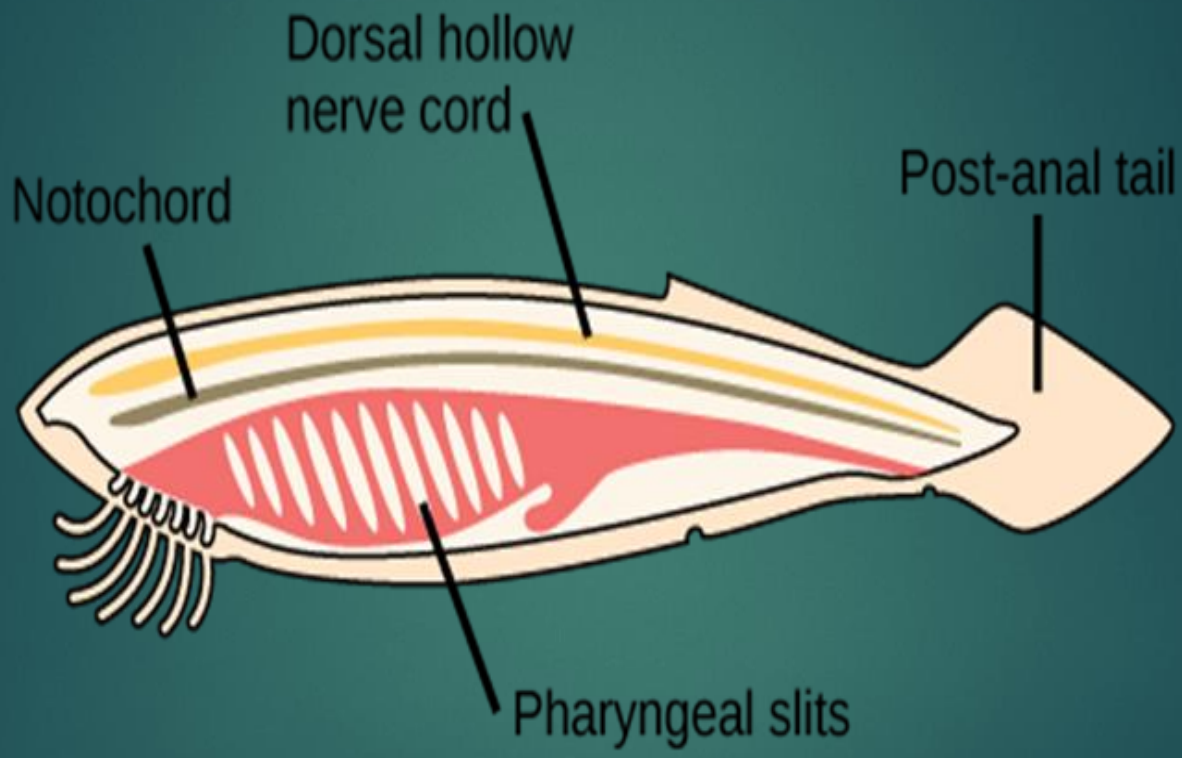


*Subphylum Hemichordata is now considered to be an invertebrate group.

Characteristics of chordates



- Notochord.** a flexible rod like structure that forms the supporting axis of the body in the lowest chordates and lowest vertebrates and in embryos of higher vertebrates.
- Pharyngeal Gill Slits.** characteristic of both hemichordata and chordate, are used by organisms in feeding. ...
- Dorsal Hollow Nerve Cord.**
- Postanal Tail.**





Classification of Chordates. Existing species of **chordates** are **classified** into three major subphyla:

- **Urochordata**

-**Cephalochordata**

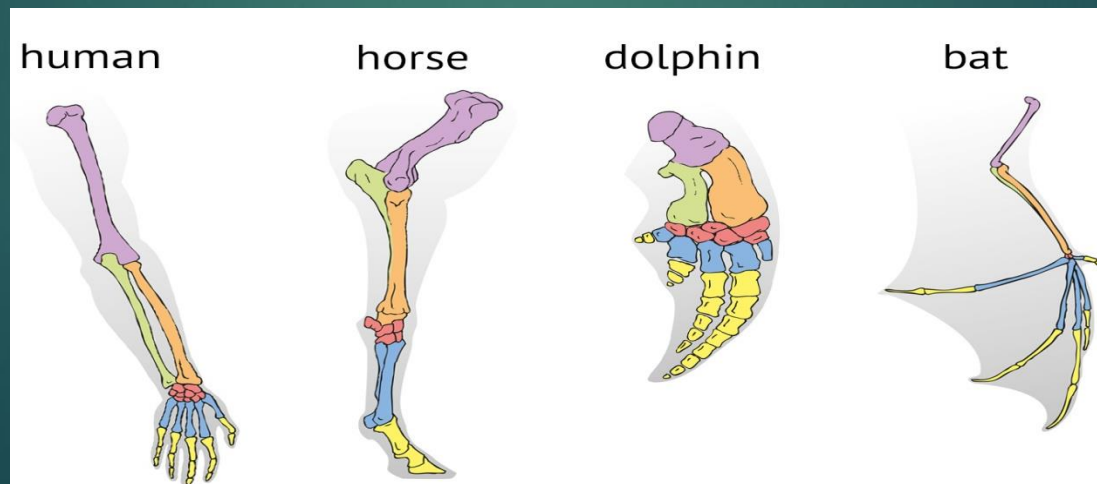
-**Vertebrata.**

Terms and Concepts of comparative anatomy

Homologous structure

The structure that are similar in different species because the species have common descent, while they may or may not have the same function.

example: the skeletons of the forelimbs of cats, the wings of birds, the arms of humans, and the wings of a bat

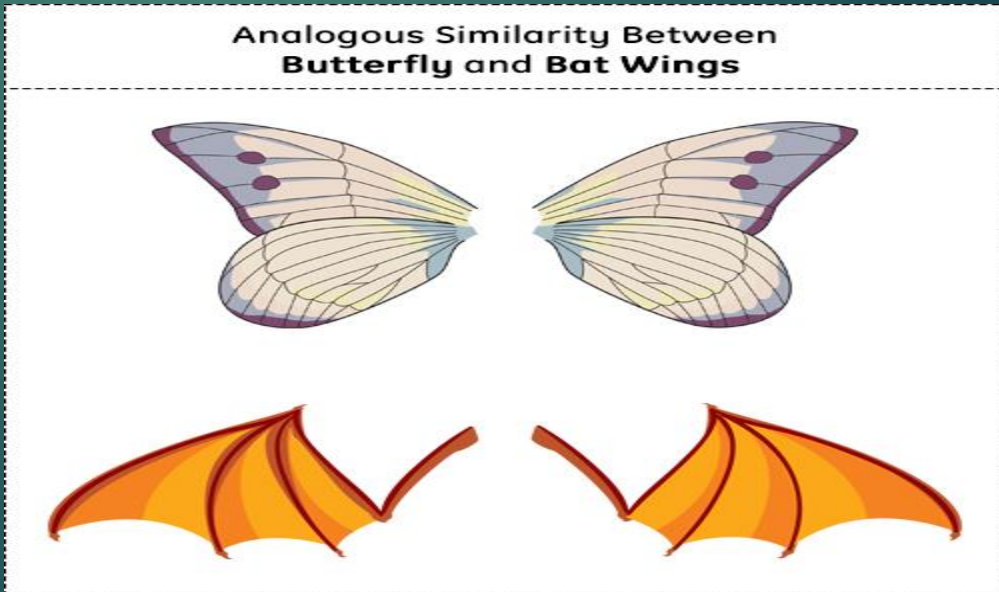




Analogous structure

Structure that are similar in different organisms because they evolved in a similar environment, rather than were inherited from a recent common ancestor , also they are sharing common function.

example: the fin of a fish and the flipper of a whale the scales of fishes and reptiles



Ontogeny

- The developmental history of an organism □ Begins with embryogenesis, the development after fertilization . □
- Includes post embryonic changes: aging or senescence and death.
- Genes are the primary operable. □

A single lifetime

phylogeny □

- The evolutionary history of group of species. □
- It requires hundreds or thousands to hundred of millions of year



THANK YOU FOR YOUR ATTENTION 😊 😊

ANY QUESTIONS ??????????