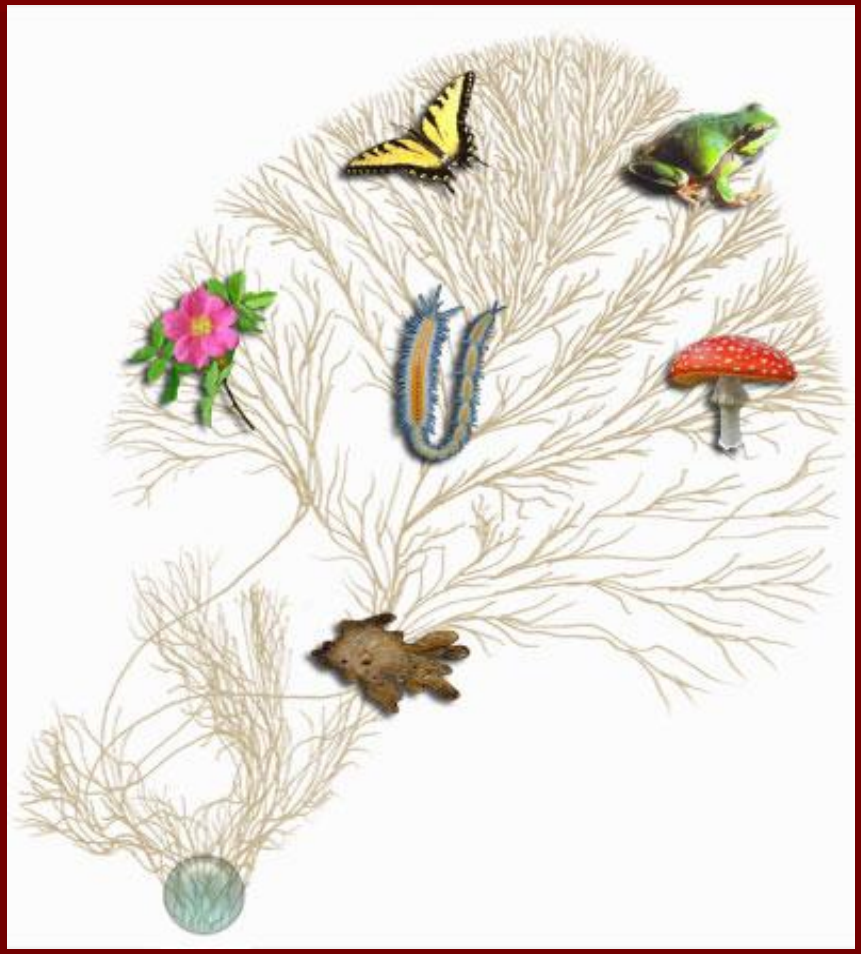
Phylogenic Trees

Phylogenic Trees

- By studying inherited species' characteristics we can reconstruct evolutionary relationships and represent them on a "family tree," called a phylogeny.



Are You my mommy?

- One way to figure out how groups of organisms are related to each other is to compare their body structures.

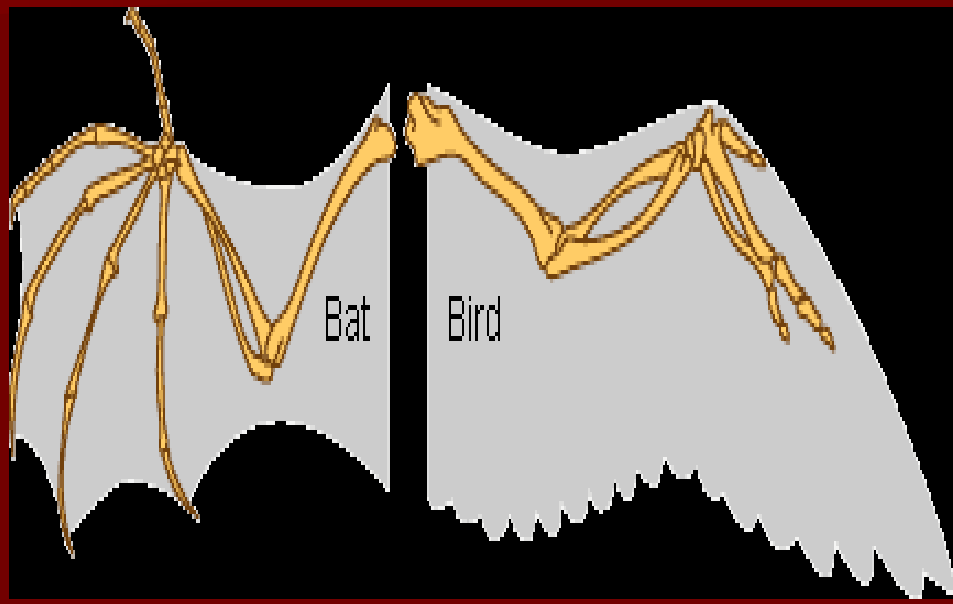
Homologous structures

- characters in different organisms that are similar because they were inherited from a common ancestor that also had that character.
- When organisms share many homologous structures it is strong evidence they are related.

Analogous Structures

- they have separate ancestors, but are look similar because they evolved to serve the same function.

- EXAMPLE
  - Birds wings and Bat wings look the same because they are both used to fly, but are physically different because they came from different ancestors

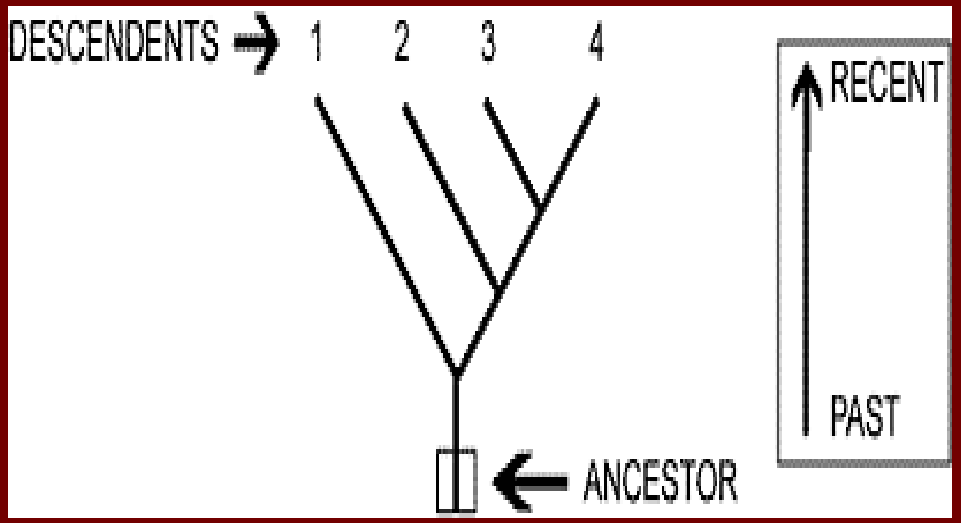


What we use trees for

- Biologists use phylogenetic trees for many purposes, including:
  - Testing hypotheses about evolution
  - Learning about the characteristics of extinct species and ancestral lineages
  - Classifying organisms

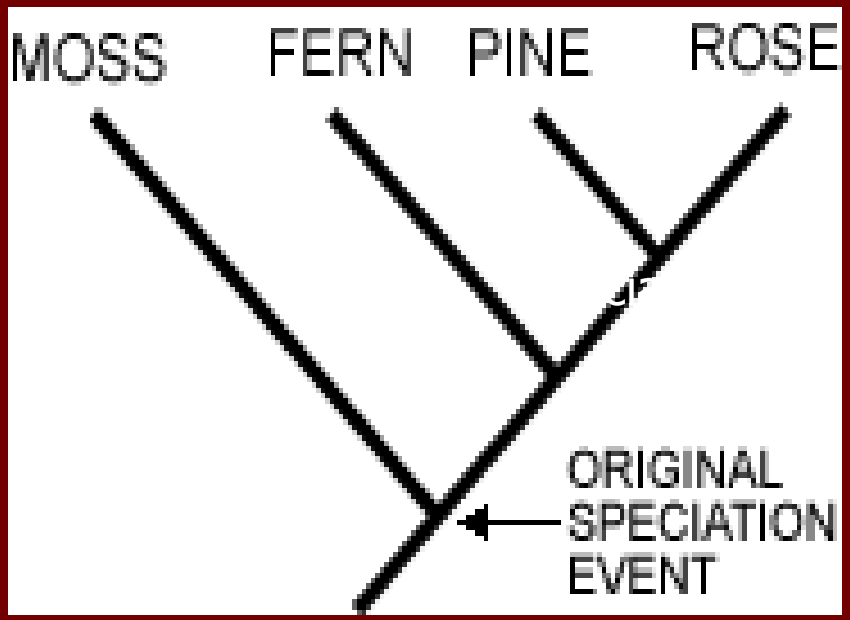
Understanding Phylogenic Trees

- The root of the tree represents the ancestral lineage, and the tips of the branches represent the descendents of that ancestor.



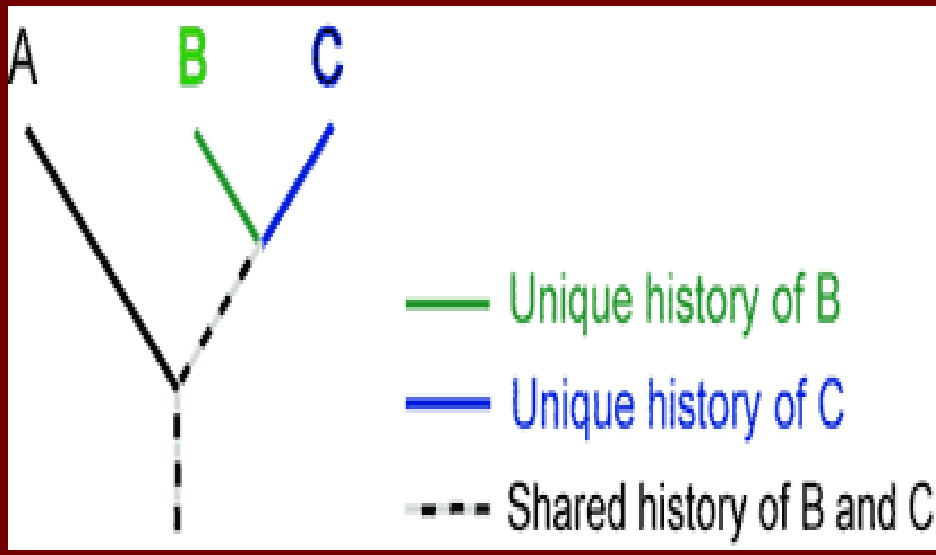
Understanding Phylogenic trees

- When a lineage splits, it is represented as branch on a phylogenic tree.
- The place at which it splits is a speciation event



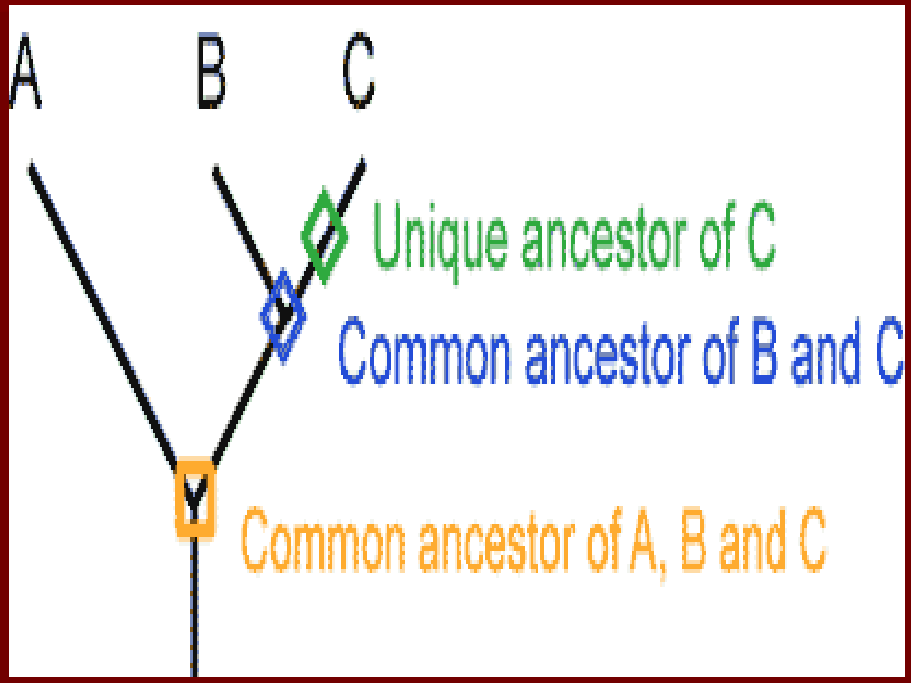
Understanding Phylogenic trees

- Phylogenies trace patterns of shared ancestry between lineages.
- Each lineage has a part of its history that is unique to it alone and parts that are shared with other lineages.



Understanding Phylogenic trees

- Similarly, each lineage has ancestors that are unique to that lineage and ancestors that are shared with other lineages—common ancestors.



Clades

- A clade is a grouping that includes a common ancestor and all the descendents (living and extinct) of that ancestor.