



Ch 26: Phylogenies Show Evolutionary Relationships

- Phylogeny = _____ history of species
- Systematics = classifying organisms and determining evolutionary relationship
- Taxonomy = _____ and organizing organisms into groups based on set characteristics
- Classification = arranging organisms into groups
- Cladistics = evolutionary classification based on common descent and _____ (derived) characteristics



How Classification Began

- Taxonomy is the branch of biology that groups and names organisms
- The first system was developed by _____, he classified things in two main groups
 - Plants
 - Herbs, shrubs, and trees
 - Animals
 - Land-dwelling, air-dwelling, and water-dwelling



How Classification Began

- Carl Linnaeus developed a method of grouping organisms that is still used today, called binomial nomenclature
 - A _____
- In this system, the first word is the _____ and the second word is the _____, the two together are called the scientific name
 - Example: *Homo sapiens*



Modern Taxonomy

- Today, species are divided into groups according to evolutionary relationship
- Evolutionary relationship can be determined by looking at:
 - _____ records, anatomical similarities, embryological similarities, and _____ similarities



How Living Things are Classified

- Organisms are divided into groups called _____
- The more taxa species have in common, the more closely related they are
 - Domain (largest, least specific group)
 - Kingdom
 - Phylum
 - Class
 - Order
 - Family
 - Genus
 - Species (smallest, most specific group)



Classification Keys

- A dichotomous key is a tool used to identify a specific organism found in nature
 - Consists of a series of _____ statements that are the opposite of each other
- Always start at the beginning of the key and gradually work your way through the statements, deciding which of the pair is true for your specimen, and following the directions given
- When you reach a Latin name, you are done!



Phylogenetic Classification

- Today, organisms are classified based on phylogeny, or evolutionary history
- A _____ is a diagram which shows phylogeny of organisms



Phylogenetic Trees

- Represents a _____ about
-

- Phylogenies are inferred from morphology and molecular homologies
 - Homologous structures
 - Careful about:
 - Convergent evolution and Analogous structures



How are evolutionary relationships determined?

- Structural (morphological) similarities
- Biochemistry: DNA and protein sequences
- Breeding behavior
- Geographical distribution



Claudistics

- _____ = ancestral species and all its descendents
- Monophyletic = clade
- Paraphyletic = _____ some species that share a common ancestor
- Polyphyletic = includes several groups with _____ ancestors

