Natural Selection

1)Evolution- change in the heritable characteristics of biological populations over successive generations.

2)Diversity- variability among living organisms

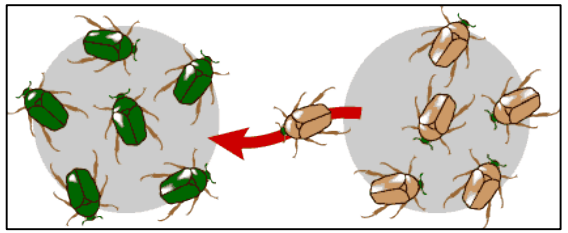
3) natural selection- organisms better adapted to their environment tend to survive and reproduce

4) Adaptation- a change or the process of change by which an organism or species becomes better suited to its environment.

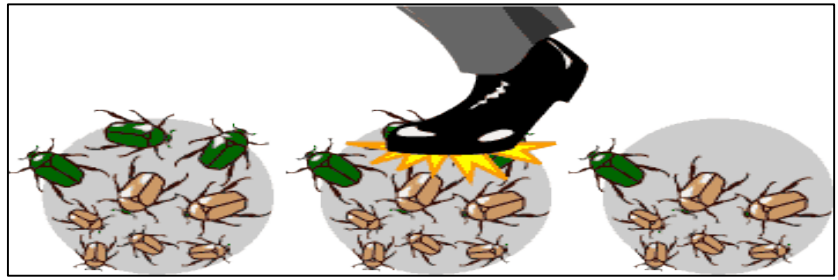
Natural Selection: The process where organisms better adapted to their environment tend to survive and reproduce. The theory of its action was first fully expounded by Charles Darwin and is now considered the main process that brings about evolution.

Mechanisms of Evolution

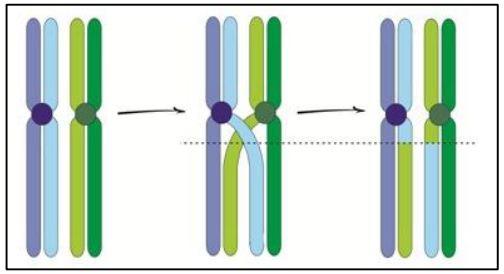
1) Gene Flow- the alteration of frequencies of alleles in a population, resulting from interbreeding with organism from a population with different frequencies



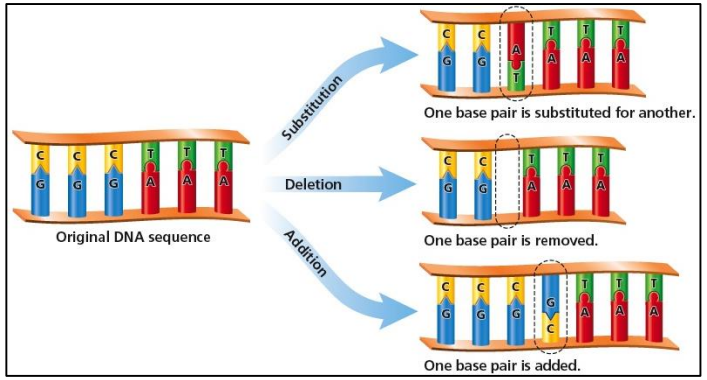
2) Gene Drift-Variation in the relative frequency of different genotypes in a small population, owing to the chance disappearance of particular genes as individuals die or do not reproduce.



3) Recombination-exchange of genetic material either between multiple chromosomes or between different regions of the same chromosome. Leads to variation of genes on offspring



4) Mutation-a permanent alteration in the DNA sequence that makes up a gene, such that the sequence differs from what is found in most people



Evidence for Evolution

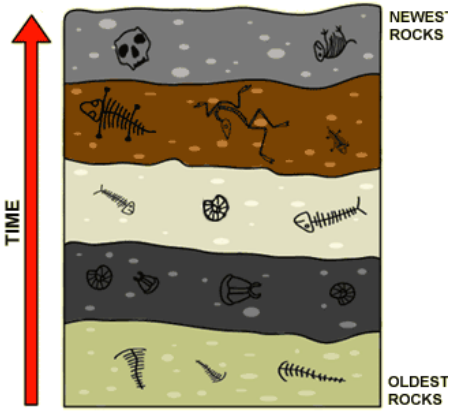
Fossil Record

What is the fossil record and why are there "gaps"?

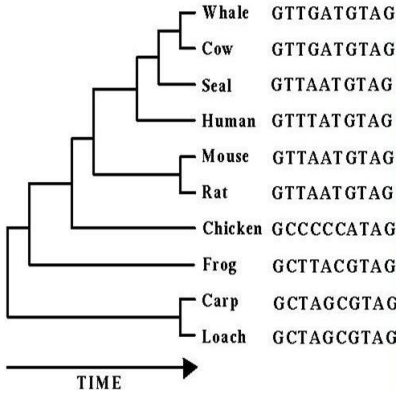
refers to the total number of fossils that have been discovered, as well as to the information derived from them. Unique situation have to occur to fossilize and organism so there "gaps" if something isn't fossilized.

How is the fossil record is evidence for evolution.

The fossil record shows how organisms have changed over time.



Molecular



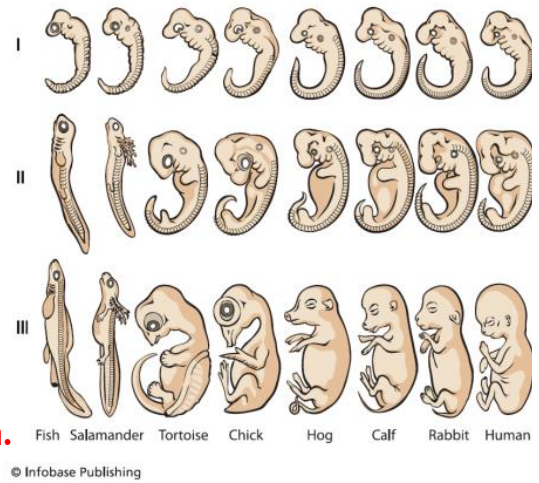
What is molecular biology?

Using DNA sequencing to analysis the relation between organisms.

Why is molecular biology a line of evidence for evolution?

If organisms share similar genetic material they must have shared a common ancestor to that DNA came from.

Embryology



What is embryology?

study of embryos and their development

How does embryology show common ancestry?

If organisms have similar development phases this shows that the DNA for the coding of development came from a common ancestor.

Why is molecular biology a line of evidence for evolution?

It shows common ancestry and common ancestry show how organism change over time

Evidence for Evolution

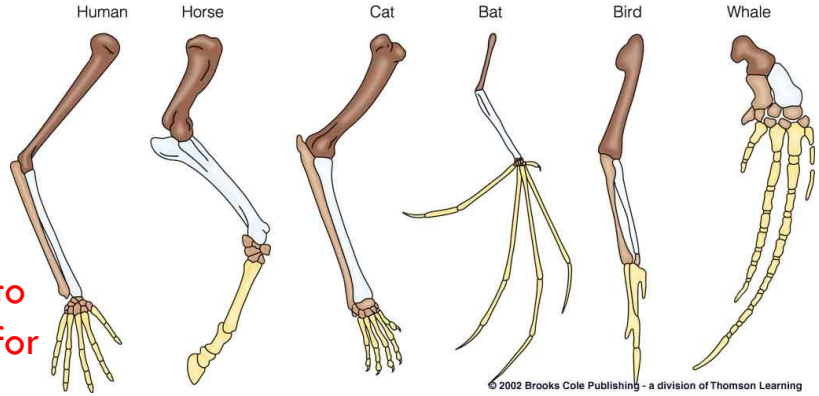
Homology

What are homologous structures?

within organism that have the same structure but different function

Why do homologous structures show common ancestry?

They show common ancestry because they would have had to share a common ancestor to have the trait for that pattern for structures passed down



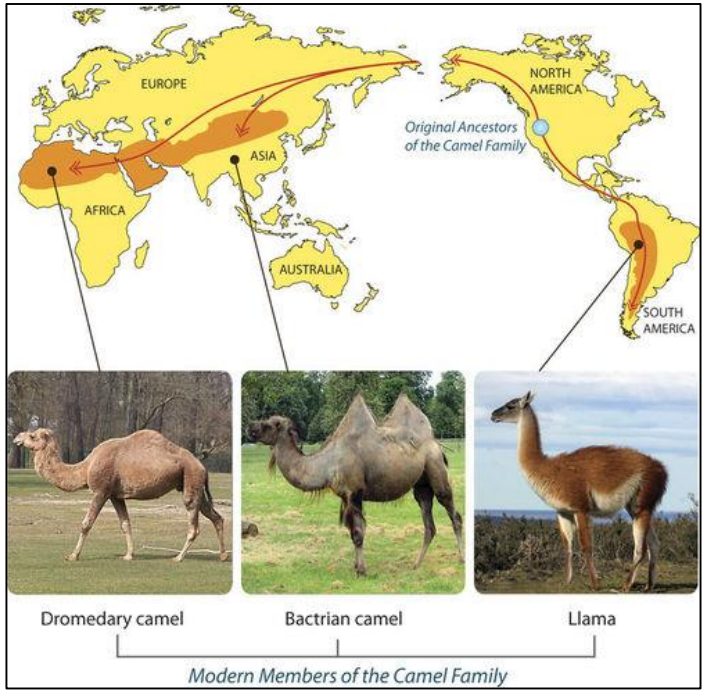
Biogeography

What is biogeography?

geographical distribution of plants and animals

Why is biogeography a line of evidence for evolution?

Organism have changed over time as the moved across continents and are exposed to different survival pressures



Taxonomy

Exclusive

Species

genus

Family

Order

Class

Phylum

Kingdom

Domain

Inclusive

Why is taxonomy important?

Gives scientist a common language to discuss and research living organisms

How do you write a scientific name?

Genus species

ex:Canis lupus

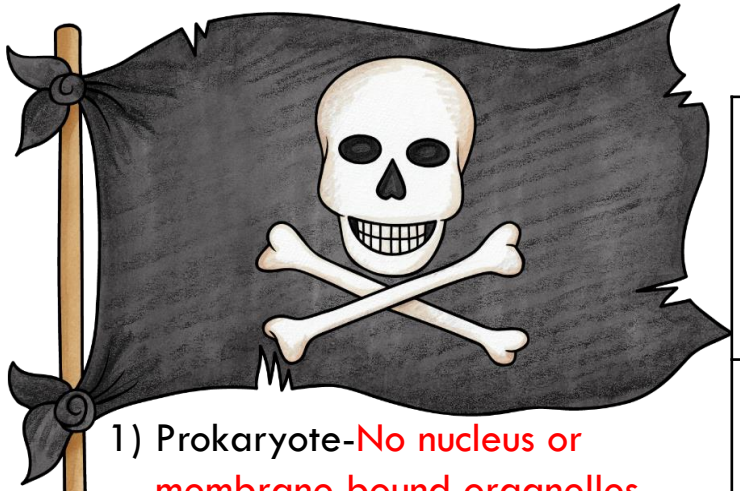
Which taxa is the most inclusive? Which taxa is the most exclusive?

Inclusive: Domain

Exclusive: Species

How can you tell how closely related organism are by their scientific name?

The more levels of taxa organism share the more closely related they are



Kingdoms of life

1) Prokaryote-No nucleus or membrane bound organelles

2) Eukaryote- Has a nucleus and membrane bound organelles

3) Cellulose-Makes up the cell wall of plants to give them structure

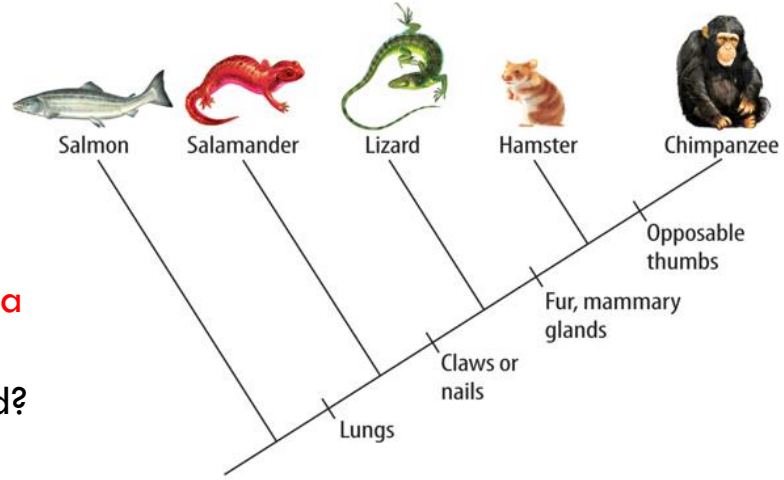
4) Chitin-Cell wall of fungi to give them structure

5) Unicellular- an organism made up of 1 cell

6) Multicellular- an organism made up of 2 or more cells

Kingdoms	Prokaryote/ Eukaryote	Autotroph/ Heterotroph	Cell Wall?	Unicellular/ Multicellular
Archae-bacteria	Prokaryote	Both	No peptidoglycan	Unicellular
Eubacteria	Prokaryote	Both	Peptidoglycan	Unicellular
Protista	Eukaryote	Both		Unicellular or colonial
Fungi	Eukaryote	Heterotroph	Made of chitin	Multicellular
Plantae	Eukaryotes	Autotroph	Made of cellulose	Multicellular
Animalia	Eukaryote	Heterotroph	None	multicellular

Cladograms



What does a cladogram show?

Shows the relationship of organism as they descend from a common ancestor

How can you tell which organisms are most closely related?

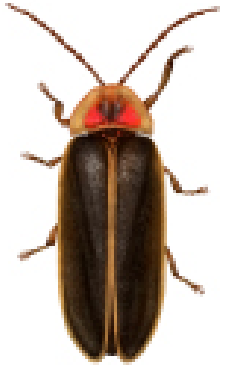
Organisms that share more traits and who's branches are closest together are the most closely related.

Dichotomous Keys

1a. Wings are covered by an exoskeleton — go to step 2.
1b. Wings are not covered by an exoskeleton — go to step 3.

2a. Body has a round shape — *ladybug*.
2b. Body has an elongated shape — *firefly*.

3a. Wings point outward from the body — *dragonfly*.
3b. Wings point toward the rear of the body — *bee*.



firefly

Bee

Dragonfly