

-**Allopatric Speciation**: fairly common, dependent upon geographic isolation

- Genetic divergence occurs during the period when they're isolated
- Overtime, speciation will occur

-**Sympatric Speciation**: occurring in same general area, no geographic isolation

- organisms occur together, gene flow increases=no genetic divergence
- "something happens"- gene flow to 0 allowing for increased likelihood of genetic divergence
- Ex. Mutation- immediate isolation(no gene pool)
 - o Snail morphology-if coils go different ways, mating impossible
 - 1 gene mutation- mechanical isolation
 - o can also occur through changes in breeding behaviors/locations
 - behavioral isolation
 - ecological isolation
 - permanently isolates populations, genetic div, speciation

-Gradualism: slow speciation rate, intermediate forms before full speciation

-Punctuated Equilibrium: rapid speciation, short bursts of evolutionary change, often results in mutation

-**Extinction**: species loss, more extinct species than currently living, can happen gradually, changes in habitat- anthropogenic effects(drought/famine)

- as species are lost, every characteristic about them becomes open to new species due to decreased competition
- could lead to genetic divergence\
- can happen bc of catastrophe, like a fire/hurricane

-Asteroids collide with Earth

- Chicxulub crater, one of most famous, Yucatan Peninsula
- No sun for a while, leads to winters
- Rapid new rate of species following extinction

-**Systematics**: method of classifying/naming organisms within an evolutionary framework

- Goals: inventory all living things
 - o Universal system for naming(Taxonomy)
 - o Determine evolutionary relationships among organisms
- Carolus Linnaeus: wrote Systema Naturea
 - o Rules for how to name organisms
 - o Derived binomial nomenclature
 - Has two names: Genus & species(Homo sapiens)
 - o If have same Genus then you'll know they may be commonly related
 - o In Latin-universal language for describing organisms
 - o Hierarchical nomenclature

- K,P,C,O,F,G,S
 - Used to organize/group organisms
 - Based upon structural similarities/difference
- Carl Woese
 - o Added Domain (above Kingdom)
 - o Separated Archaea and Eukarya
 - o Bacteria, Archaea, Eukarya
 - o Prokaryotes-lack membrane-bound nucleus
 - o Eukaryotes- have membrane-bound nucleus

-Phylogeny:

- Phylogenetics-
 - o Technique/tool for reconstructing evolutionary history or relationships based upon common ancestry
 - o Fossil records, shared characteristics, gene sequences
 - o Represented by phylogenetic trees
 - o All trees have a base of a common ancestor
 - o EXAMPLE:
 - red algae and chlorophytes and hornworts have shared characteristics that relate them to Vascular plants
 - o You have to map out the traits of each living thing to distinguish what they have in common
 - o On some points of the tree, a few living things have different things in common
 - Everything below it, lacks that character, above possesses that character