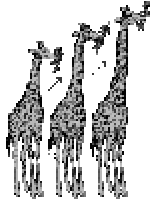




## Introduction to Evolution



## Basic Definitions:

- ✓ Evolution: The process by which organisms change over time.
- ✓ Fossils: Remains or traces of organisms that lived in the past.
- ✓ Naturalist: A scientist who studies nature by observing plants and animals.



## Basic Definitions:

- ✓ Population: All of the members of the same species that live in the same area.
- ✓ Gene Pool: All of the genes in a population.
- ✓ Species: A group of organisms that look alike and can reproduce among themselves.



## Early ideas:



- ✓ Carolus Linnaeus -- (1707-1778)
  - Unchanging order of life created by God.
  - Troubled late in his life over plant hybrids created through cross-pollination.
  - Never said plants evolved.

## Early ideas:



- ✓ Comte de Buffon--(1707-1788)
  - French Zoologist
  - Said living things do change through time.
  - Said species could change over generations, but would not evolve into new species.
  - Expressed that the Earth must be older than 6000 years.
  - He speculated that the Earth was 75000 years old.
  - Suggested humans and apes were related.

## Early Ideas:



- ✓ Erasmus Darwin -- (1731-1802)
  - Grandfather of Charles Darwin
  - English physician, poet, amateur scientist
  - Believed evolution had occurred--didn't know how, but wrote about it in his poems.

## Early ideas:



- ✓ Jean Baptiste Pierre Antoine de Monet Chevalier de Lamarck--(1744-1829)
  - French Naturalist
  - Theory of Evolution (1809)
    - Law of Use and Disuse--Organisms develop traits or characteristics by the use or disuse of body parts.
    - Law of Acquired Characteristics--Traits develop over a lifetime and are passed on to offspring--inheritance of acquired characteristics.



## Early Ideas:



- ✓ George Cuvier--(1769-1832)
  - French Scientist
  - Criticized Lamarck and rejected his theory--said then cowboy children would all be born bowlegged because their parents had become bowlegged from riding horses.
  - Documented the extinction of ancient animals--first to do so.
  - Said that there had to be sudden catastrophes which would kill off organisms and then new ones would move in.

## Early ideas:

- ✓ Charles Lyell-- (1797-1875)
  - English Scientist
  - Slow progressive changes not quick like Cuvier had said.

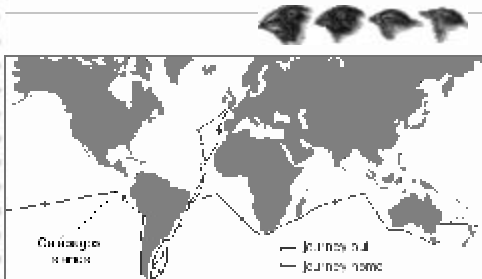


## Today's Accepted ideas:



- ✓ Charles Robert Darwin--(Feb. 1809-1882)
  - British Naturalist
  - 1831: At 22 years of age, Darwin went on a voyage on the HMS Beagle for a 5 year mapping and collecting expedition in South America and the South Pacific.
  - On the expedition: Stopped at the Galapagos Islands where he noticed 13 species of finches which he differentiated by their beaks.

## Darwin's Journey:



## Darwin Continued:

- ✓ 1851: "Origin of the Species by Means of Natural Selection"
- ✓ Expressed a decent by modification and random variations.
- ✓ Darwin's Evolutionary Theory:
  - Overproduction
  - Competition
  - Variation
  - Survival of the Fit

## Darwin's Theory Definitions:

- ✓ Overproduction: More organisms are produced than can survive.
- ✓ Competition: Organisms compete for limited resources.
- ✓ Variation: There are differences among traits and characteristics in a species. (Differences in a species.)
- ✓ Survival of the Fit: Traits allow the organism to be well adapted and have a better chance to survive.

## Survival of the Fit:

- ✓ Due to variations created through:
  - Mutation
  - Migration
  - Geographic Isolation

## More definitions and such:

- ✓ Geographic Isolation: Results in speciation and reproductive isolation.
- ✓ Speciation: The development of a new species.
- ✓ Reproductive isolation: Organisms can no longer mate with organisms that are similar. (Proves there is now a new species.)

## Alfred Russell Wallace:



- ✓ 1823-1913
- ✓ English
- ✓ 1850's Wrote a paper and sent it to Charles Darwin to critique. (Turned out to be extremely similar to Darwin's Origin of the Species.)
- ✓ Hardly ever mentioned in Science books...=(

## Latest:

- ✓ 1858-- A combination of Darwin's and Wallace's works were presented to the "Linnean Society."
- ✓ March 1864-- "The Origin of the Human Races Deduced from the Theory of Natural Selection" was presented (Anthropological Society.)