

DISCLAIMER:

This unit is based upon scientific investigation resulting in Scientific Theories and Laws. Let's review:

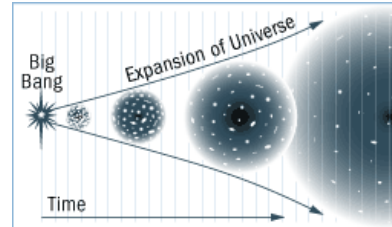
Scientific Theory – an explanation for what has been shown many times.

Scientific Law – a relationship in nature that has been proved many times and there are no exceptions.

QUIZ 8B

HISTORY OF LIFE

Big Bang Theory – the universe formed by rapid expansion of matter and energy from an initial infinitely small, dense point



FOSSILS

Fossils – preserved remains of living things found in the rock layers on Earth; how changes in organisms are observed over time

Paleontologist – scientist who studies fossils

Homologous Structures – structures that occur in different species; similar enough to suggest the species had a common ancestor

Example:

Vestigial Structures – structures that had a function in an ancestral organism but no longer have a function

Example:

Analogous Structures – structures in different species with the same function but do not share a common ancestor

Example:

Index Fossils – used to date other fossils; organisms found on Earth for a short period of time but in large numbers

Example:

- THREE reasons given for Index Fossils being used to date rock layers?

- 1.
- 2.
- 3.

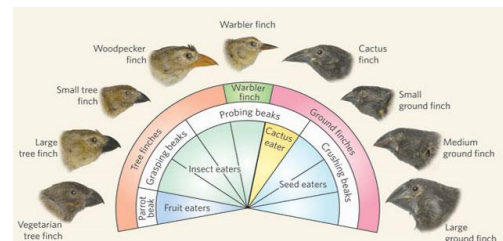
Principle of Superposition – in areas of undisturbed rock, the oldest rocks are at the bottom and the youngest rocks are on the top; rock layers can be altered due to folding and faults



NATURAL SELECTION

Natural Selection – the process by which species pass on the beneficial traits that help them survive.

Evolution – the THEORY that life on Earth has changed over time; specifically, the inherited characteristics or traits within a population change over generations



ORIGINS OF SPECIES

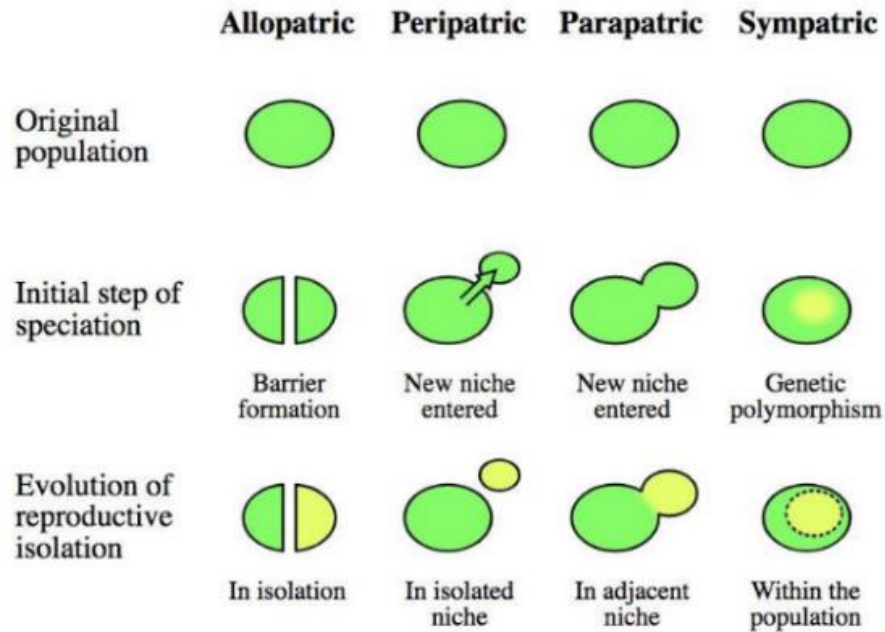
Biological Species – a group of interbreeding organisms that can produce fertile offspring.

Speciation – origin and formation of a new species; not really “observable” as it takes place over a long period of time.

- A population divides and become isolated from one another and there is no interbreeding between the new populations.

TYPES of Speciation

1. **Allopatric** – Barrier formation or geographic changes force the population to be isolated into different groups
 - a. **Example:**
2. **Peripatric** – Habitat change resulting in a new niche needing to be filled which is then separated, or isolated from the original population
 - a. **Example:**
3. **Parapatric** – Habitat change resulting in a new niche needing to be filled but is kept in contact with the original population
 - a. **Example:**
4. **Sympatric** – A genetic change or shift occurs in the population creating a new population within the original population (usually due to a change in number of chromosomes); controversial among scientists
 - a. **Example:**
5. **Artificial** – A creation of a new species by human intervention.
 - a. **Example:**



GEOLOGIC TIME

Relative Dating – looking at the location of the rock layers gives a relative age of the rocks

Absolute dating or Radiometric dating – the use of radioactive isotopes of minerals in the rocks to determine the actual age of the rocks

Geologic Time Scale – A table that shows the time across geologic history (see image below)

HIGHLIGHTS

Precambrian Era – LONGEST era of Earth’s History and OLDEST

- Prokaryotes – came into existence more than 3.5 billion years ago; dominated the Earth for about 2 billion years
- Eukaryotes – appeared about 1.5 billion years ago

Paleozoic Era – began roughly 542 million years ago; age of great diversity – undersea world; plants started to move to land at the end of this era

- Ended as a result of the Earth’s largest MASS Extinction – loss of 90% of marine life and 70% of life on land

Mesozoic Era – began about 250 million years ago; the age of the reptiles (time of the dinosaurs)

- Ended with a Mass Extinction

Cenozoic Era – began about 65 million years ago; the age of the mammals ... continues today

GEOLOGIC TIME SCALE			
ERA	PERIOD	EPOCH	SUCCESSION OF LIFE
CENOZOIC recent life	QUATERNARY 0-1 Million Years Rise of Man	Recent Pleistocene	
	TERTIARY 62 Million Years Rise of Mammals	Pliocene Miocene Oligocene Eocene	
MESOZOIC middle life	CRETACEOUS 72 Million Years Modern seed bearing plants, Dinosaurs		
	JURASSIC 46 Million Years First birds		
	TRIASSIC 49 Million Years Cycads, first dinosaurs		
PALEOZOIC ancient life	PERMIAN 50 Million Years First reptiles		
	Carboniferous PENNSYLVANIAN 30 Million Years First insects		
	MISSISSIPPIAN 35 Million Years Many crinoids		
	DEVONIAN 60 Million Years First seed plants, cartilage fish		
	SILURIAN 20 Million Years Earliest land animals		
	ORDOVICIAN 75 Million Years Early bony fish		
	CAMBRIAN 100 Million Years Invertebrate animals, Brachiopods, Trilobites		
	PRECAMBRIAN Very few fossils present (bacteria-algae-pollen?)		