**Biology summary unit 5 evolution**

**Section 5. Theory of evolution**

There are millions of different organisms on Earth. Most scientists are convinced that new species can be formed and can change over long periods of time. The process of formation, changing and disappearance of species is called ***evolution***. The ***theory of evolution*** developed in the 18th century. There are many facts that support the theory. The theory of evolution was first proposed by a British naturalist Charles Darwin. The theory of evolution is based on:

1. ***Genetic mutations***, most plants and animals reproduce sexually. New genotypes are formed because of mutations and sexual reproduction. An organism’s phenotype depends on the genotype and the environmental factors. If new genotypes are formed, then new phenotypes may be the result
2. ***Natural selection***, certain organisms produce large numbers of offspring. But apparently there are not enough nutrients for all the offspring. So, not all of the offspring can survive. There is a rigorous selection of offspring. This process is called natural selection. Living things are adapted to suit the environment. These adaptations are determined by their genotype. The best adapted individuals survive.
3. ***Formation of new species***, it is extremely important that there is a lot of variety within a species. This improves the chances of survival when conditions in their environment change. If members of the new form only mate within the newly formed group, a subspecies can occur. If the 2 different forms reproduce, then offspring of the same species are produced. In this case no new species is formed. New species may also emerge because some members have become separated or isolated from other members of their species.

**Section 6. Evidence supporting the theory of evolution.**

As a result of the massive amount of evidence for biology evolution that has been accumulated over the last 2 centuries, you may conclude that evolution has occurred and continues to occur. The theory is based on:

1. ***Fossils***, fossils are petrified remains of organisms or imprints of organisms in rocks. Fossils are formed when remains of organisms are covered up by ***sediments***. The layers of sediment form a protective covering to slow down the process of decay. When more and more layers are deposited, eventually sedimentary rock is formed because of the pressure from above that squeezes the sediment into layers.
2. ***Homology***, if animals have very similar bone structures it could probably that these bones evolved from the same structure in some ancestral species. It’s suggested that these animals had a common ancestor.
3. ***Rudimentary organs***, rudimentary organs are evidence of evolution and represent a function that was once necessary for survival, but which over time has become non-existent. Rudimentary organs are not used anymore and are not well developed. Rudimentary organs support the fact that different organisms have a common ancestor.
4. ***Embryology***, embryos of different vertebrates look alike in their embryonic development stages. The embryos start out looking virtually identical, however as they develop the appearances diverge. The similarity at the early stage supports the idea that vertebrates have a common ancestor.

**Biology summary unit 5 evolution**

**Section 7. History of life on earth.**

***Precambrian*** ( 4600-542 million years ago):

* 3800 million years ago, first simple life forms occur only live in the water. No oxygen.
* 3500 million years ago, first bacteria and unicellular organisms occurred.
* 2700 million years ago, oxygen is released.
* 2100 million years ago, first unicellular plants
* 1600 million years ago, first multicellular organisms.

***Paleozoic*** ( 542-251 million years ago): first animals occurred.

***Mesozoic*** ( 251-65 million years ago): first terrestrial plants

***Cenozoic***: ( 65-now): first terrestrial animals and humans.