**Biological Diversity Review Summary**

* Biological diversity refers to the differences that exist among living in their ecosystems. Species of living things show diversity in cellular makeup, method of reproduction and adaptations
* Linnaeus devised the binomial nomenclature system of classifying living things by placing species into groups according to similarities in structure. The system includes seven levels of classification:
  + Kingdom🡺 Phylum 🡺 Class 🡺 Order🡺 Family🡺 Genus 🡺 Species
* Each species is identified by its genus and species name. For example, the dog has the scientific name *Canis familiaris* while the wolf is *Canis lupus*
* An ecosystem is made up biotic (living) and abiotic (nonliving) factors. Organisms live in communities within an ecosystem and interact with one another and the air, water, and soil surrounding them. Such relationships may be beneficial or harmful. Bees and flowers are involved in a mutualistic relationship where both the bee and the flower benefit. Sometimes only one organism in a relationship benefits and the other organism is not harmed. This relationship is referred to as commensalism. In other relationships, one organism is harmed and one benefits: the tapeworm is a parasite that harms its host. Mutualism, commensalism and parasitism are types of symbiotic relationships.
* Producers use the sun’s energy in the process of photosynthesis to sustain life. They become the basis of food for consumers. Eventually both the producers and consumers die and are decomposed back into nutrients by decomposers.
* The survival of a species is ensured by the ability of the members to reproduce offspring of their own kind. Simple organisms reproduce asexually. Bacteria simply split in half, through binary fission. Hydra develops buds that grow into new hydra. Many plants grow by vegetative propagation from roots and stems. Asexual reproduction requires only one parent and all offspring are identical to the parent.
* Other living organisms reproduce sexually. The sperm gamete produced by the male unites with the egg cell gamete produced by the female in the process of fertilization. A zygote is formed and grows during the process of mitosis into new individuals. Sexual reproduction involves two parents and results in offspring that are genetically different from the parents.
* The basics of organisms diversity lies in the DNA. Sex cells contain millions of genes in their chromosomes. The genes contain strands of DNA that attach to one another in various combinations, thereby producing hereditary traits. Such variations can be discrete or continuous. Discrete variations are distinct; for example eye color is either blue or brown. Continuous variations show a range; for example, the height of humans ranges from 1.2m to 2.1m
* Some individual traits appear more frequently in populations than others. For example, in humans brown eye color is a dominant trait and blue eye color is a recessive trait. Through artificial section, plant and animal breeders are able to take desirable traits from one species to improve another species. For example, genes from jellyfish have been added to the genetic makeup of the tomato plant to produce a plant that can resist a certain fungus disease, thereby, producing a better yield. This is a form of genetic engineering.
* Nature, too, has a way of changing species. Generally, the strongest and fittest members of a species survive and are able to pass on their traits to the offspring. Over time, organisms that have the adaptations to best survive in the environment are the ones that reproduce and pass these key traits onto their offspring. As generations go on, these traits continue to get passed on and those characteristics allow certain species to be best suited for those environments, while less favourable genes die out with the ‘less equipped’ species. Changes that occur in nature are referred to as natural selection.
* The survival of living organisms is dependent on the state of its ecosystem. When the natural ecosystem becomes affected by human factors of urbanization, agriculture, and pollution, the organisms within are placed under stress. Their numbers decline. Many plants and animals have become extinct. Others are endangered. Some are vulnerable and threatened. Others have been extirpated and no longer exist in a certain area. As species are reduced in numbers and disappear the biodiversity decreases.