Unit Learner Outcomes

High School Biology Unit on Genetics

Meiosis

* Students will learn vocabulary concerning the meiotic process. However, most of the terms should be familiar to them from the process of mitosis.
* Students will gain a better understanding of the purpose of meiosis, and how it occurs only in sex cells.
* Students will understand why there are two different kinds of cell division occurring, and be able to describe the differences between meiosis and mitosis.
* Students will understand the meaning of homologous chromosomes.
* Students will learn the phases of meiosis and be able to put them in the correct order.
* Students will be able to compare and contrast the differences between spermatogenesis and oogenesis.

Mendel and Stemming Discoveries

* Students will be able to describe Mendel’s research he did on pea plants including what he did and how he discovered what he did.
* Students will be able to describe the differences of an individual’s genotype and an individual’s phenotype.
* Students will be able to describe what the Law of Segregation is.
* Students will be able to describe what the Law of Independent Assortment is.

Chromosomes

* Students will be able to speak knowledgably about various genetic disorders and how they occur.
* Students will be able to tell what traits are sex-linked and what parent that they are usually associated with.
* Students will be able to know the basis of ABO blood types and how it is tested.
* Students will be able to understand the phenomena of incomplete dominance and provide examples of specific traits.
* Students will be able to provide examples of traits that are governed by polygenic inheritance.

DNA

* Students will be able to learn the vocabulary associated with DNA.
* Students will be able to understand that DNA is the source of genetic material of all living things.
* Students will be able to correctly match base pairs together, which will result in the understanding of DNA structure.
* Students will be able to label and describe the steps of DNA replication.
* Students will be able to explain why DNA repair is needed, and describe the different modes of DNA repair.

Production of Proteins

* Students will be able to describe how RNA comes into play with the process of transcription.
* Students will be able to describe the process of translation and the different kinds of RNA that are associated with the process.
* Students will be able to identify and describe all of the roles and functions of proteins that are needed for transcription and translation.
* Students will be able to know how to translate codons into amino acids, and know that amino acids are building blocks of proteins (protein synthesis).

Viral and Bacterial DNA

* Students will be able to compare and contrast the DNA of humans, viruses, and bacteria.
* Students will be able to recall experiments that have been done to prove that DNA is the source of genetic material.
* Students will be able to describe how viruses and bacteria are so successful in reproduction.

DNA Technology

* Students will be able to come up with various examples of why DNA technologies would be/could be used. (Economically, personal reasons, healthier foods, etc.)
* Students will be able to describe the process of cloning in plants and animals.
* Students will be able to justify whether certain DNA technology experiments or practices would be ethical or not.
* Students will be able to describe the importance of genomics and what it can tell us.
* Students will be able to develop their own biotechnology experiment and report to the class that it would be helpful to better the world or community.

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