

Objectives for Unit 1 - Part 2: DNA, Genes, & Chromosomes

You will UNDERSTAND the following concepts...

- Most cells have genetic information that determines traits.
- Organisms inherit genetic information in a variety of ways that result in variations/similarities in organisms.
- Models of genetic inheritance can be used to show the probability of traits being expressed.
- Genes can be modified through mutation or human intervention.
- Genetic traits are passed from parents to offspring.

Underlined terms
are required
vocabulary words.

You will KNOW the following ideas and concepts...

- A single celled (unicellular) organism has one cell; a multi-cellular organism is made of many cells.
- Some organisms are single-celled and others are multi-cellular, including humans.
- DNA
 - DNA is the genetic material that contains the traits of any organism.
 - DNA is found inside the nucleus of most organisms.
 - A random change in an organism's DNA is called a mutation. A mutation can be helpful, harmful, or neutral.
 - New traits develop due to changes in an organisms DNA.
- Genes
 - A gene is a segment of DNA.
 - A human cell contains many thousands of genes. Each human cell contains a copy of all the genes needed to produce a human being.
 - Each gene sequence results in a trait.
 - The environment may affect the expression of genes. In other words, two organisms may be genetically identical, but not look exactly the same.
- Chromosomes
 - Chromosomes are coiled up DNA.
 - All organisms have a characteristic number of chromosomes in their body cells and their sex cells have ½ that normal number.
 - In a human body cell, there are 46 chromosomes. A human sex cell has 23.
 - Each body cell in a multi-cellular organism has the exact same DNA as every other cell even though each cell does a different job!
- Cell division
 - The purpose of cell division in single celled organisms is for reproduction.
 - The purpose of cell division in multi-cellular organisms is for growth, maintenance, repair, and replacement.
 - Cancers are a result of abnormal cell division.
 - The most common type of cell division creates body cells (daughter cells) that are genetically identical to the original cell.
 - There is a special type of cell division that creates sex cells.

You will BE ABLE TO DO the following activities...

- Create a model to represent DNA, genes, and chromosomes. (DNA Dog)
- Interpret/analyze data/graphs and draw conclusions.
- Complete the DNA, Chromosomes, and Genes webquest.