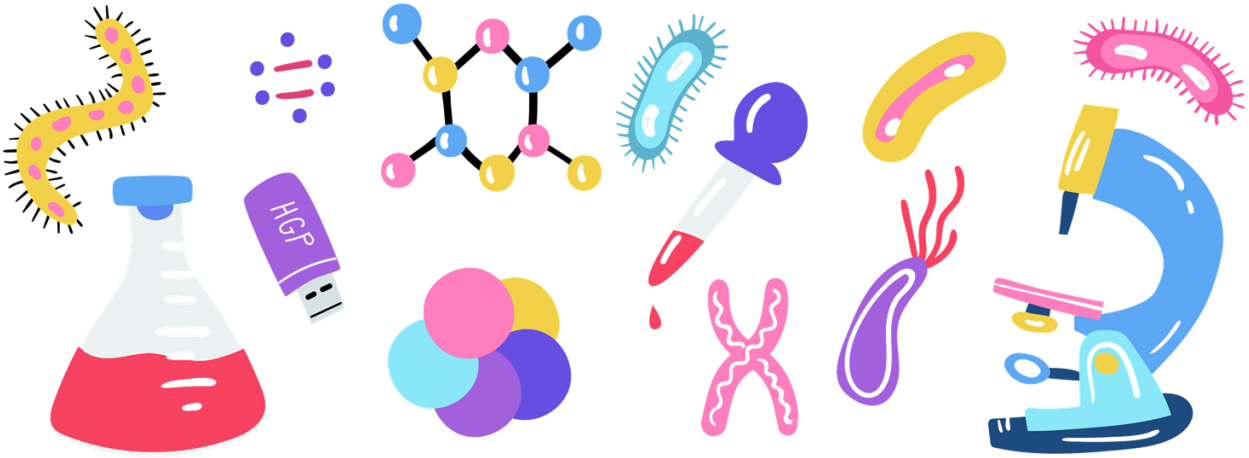
Modern Genetics

Section 4: Advances in Genetics



Everything that makes you who you are is all stored in DNA. Scientists call all of the DNA in one cell of an organism its **genome**. The term genome comes from the combination of the words gene and chromosome. In 1990 researchers created the **Human Genome Project** with the focus of identifying the DNA sequence of every gene in the human genome. This would require them to figure out every gene that belonged to every chromosome and where each were located. The goal in the unraveling of all genes was that they would be able to control the actions of certain key genes and in the future be able to treat patients with a recognizable combination of genes. **Gene therapy** involves inserting copies of a gene directly into a person's cell.

The knowledge scientists have acquired through the studying of DNA also led them to try to identify and correct the defects that produce genetic disorders. **Genetic engineering** is where genes from one organism are transferred into the DNA of another organism. For example, **cloning** is a type of genetic engineering. A **clone** is an organism that has exactly the same genes as the organism from which it was produced. While extremely controversial, in 1996 scientists cloned a sheep named Dolly. Also, a lot of the food that is sold in stores is genetically engineered. Tomatoes can be engineered to be bigger, stay fresh longer, and all be harvested at the same time.

Another advance in genetics can be seen in **selective breeding**, which is the process of selecting organisms with desired traits to be parents of the next generation. This can be achieved through **inbreeding**, which crosses two individuals that have similar characteristics or through hybridization. **Hybridization** is when breeders cross two genetically different individuals in hopes that the offspring will have the best traits from both parents.