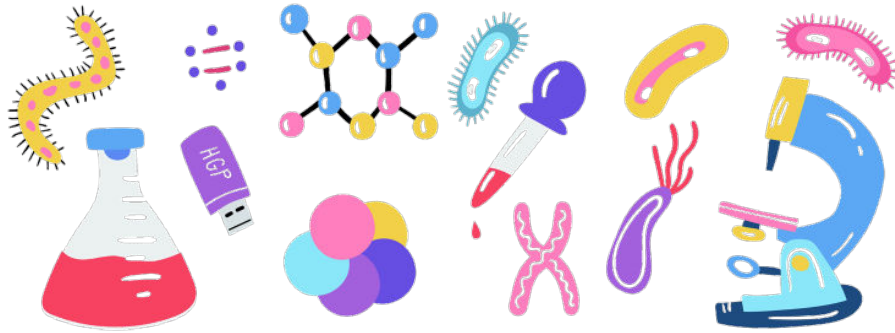


Modern Genetics

Section 4: Advances in Genetics



Everything that makes you who you are is stored in your DNA. Scientists refer to all of the DNA in a single cell as the **genome**. The word genome comes from combining the terms *gene* and *chromosome*. In 1990, researchers began the **Human Genome Project**, an effort to identify the DNA sequence of every gene in the human genome. This required scientists to determine which genes were located on each chromosome and where they were positioned. By mapping the genome, scientists hoped to better understand how genes function and to eventually develop ways to treat diseases linked to specific genes.

One possible application of this research is **gene therapy**, which involves inserting copies of a gene directly into a person's cells to correct or replace faulty genes. Advances in genetics have also led scientists to explore ways to identify and correct the causes of genetic disorders. **Genetic engineering** is the process of transferring genes from one organism into the DNA of another organism. One example is **cloning**, in which an organism is produced with the exact same genetic information as another. In 1996, scientists successfully cloned a sheep named Dolly. Today, many foods are genetically engineered. For example, tomatoes can be modified to grow larger, stay fresh longer, and ripen at the same time.

Another important advancement is **selective breeding**, the process of choosing organisms with desirable traits to serve as parents in the next generation. This can be done through **inbreeding**, which involves crossing individuals with similar traits, or **hybridization**, where breeders cross genetically different individuals in hopes that the offspring will inherit the best traits from both parents.

Review:

1. What is the Human Genome Project?
2. Explain what it means if something is genetically engineered.
3. What is hybridization?