

- in all and some found in just some types (chloroplasts in plants)
 - Prokaryotic: lacks a nucleus or other membrane-enclosed organelles, generally smaller
- Life's Processes Involve the Expression and Transmission of Genetic Information
 - In cells, chromosomes contain genetic material in DNA
 - DNA Structure and function
 - Before a cell divides, DNA is replicated and each of the two offspring inherits a complete set of chromosomes
 - Each chromosome contains one very long DNA molecule with hundreds of thousands of genes, units of inheritance that encode the information necessary to build all of the molecules synthesized within a cell, establishing that cell's identity and function
 - DNA molecule is made up of two strands-made up of four nucleotides (ATCG) that are like a four letter alphabet
 - DNA provides blueprints for making proteins
 - Genes control protein production indirectly using a related molecule called RNA as an intermediary
 - Gene expression: process in which the information in a gene directs the manufacture of a cellular product
 - Differences between organisms reflect differences in their nucleotide sequences rather than their genetic codes
 - Some RNA molecules are translated into proteins, but some do other tasks like regulating the functioning of protein-coding genes
 - Genomics: Large-Scale Analysis of DNA sequences
 - Genome: Entire "library" of genetic instructions that an organism inherits
 - The entire sequence of nucleotides in the human genome is now known
 - Genomics: researchers study whole sets of genes in one or more species
 - Made possible by "high-throughput" (tools that can analyze biological materials rapidly), bioinformatics (Use of computational tools to store, organize, and analyze huge volume of data that results from high-throughput methods), and formation of interdisciplinary research teams (melting pots of diverse specialists like mathematicians and engineers)
- Life requires the Transfer and Transformation of energy and matter
 - When an organism uses chemical energy to perform work, some is

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