**Aids (Acquired Immunodeficiency Deficiency Syndrome)** a usually fatal, slow acting disease caused by the [HIV](javascript:JumpTo('#HIV')) retrovirus. Important disease-fighting white blood cells are destroyed resulting in a weakened immune system. Death usually comes as a result of cancer or other diseases that are normally fought off by healthy immune systems. HIV is spread from person to person via bodily fluids such as blood and semen. The common methods of transmission are via sexual intercourse or sharing hypodermic needles.

**amino acids** organic molecules that are building block of [proteins](javascript:JumpTo('#protein')). There are 20 different kinds of amino acids in living things. Proteins are composed of different combinations of amino acids assembled in chain-like molecules. Amino acids are primarily composed of carbon, oxygen, hydrogen, and nitrogen.

**Autosomes any chromosomes other than a** [sex chromosome](javascript:JumpTo('#sex_chromosomes'))

**biocultural evolution the pattern of human evolution in which the effects of natural selection are altered by cultural inventions. Culture can alter the direction of evolution by creating non-biological adaptations to environmental stresses (e.g., wearing insulating clothes on very cold days). This potentially reduces the need to evolve genetic responses to the stresses. This has meant that we have been able to remain essentially tropical animals biologically and live in colder regions of our planet. Biocultural evolution can also involve a mutual, interactive evolution of human biology and culture. An example of this has been the selection favoring** [sickle-cell trait](http://anthro.palomar.edu/synthetic/glossary.htm#sickle-cell_trait) **in Africa. Human agricultural practices altered the environment, which resulted in factors that were advantageous to both the malarial microorganisms and the mosquitoes that transmit them between people. This, in turn, selected for the sickling allele.**

**Chromosomes** thread-like, gene-carrying bodies in the cell nucleus. Chromosomes are composed primarily of [DNA](javascript:JumpTo('#DNA')) and [protein](javascript:JumpTo('#protein')). They are visible only under magnification during certain stages of cell division. Humans have 46 chromosomes in each [somatic cell](javascript:JumpTo('#somatic_cell')) and 23 in each [sex cell](javascript:JumpTo('#sex_cell')).

**color blindness** the inability to see certain colors as they normally appear to others. The most common form of this vision deficiency is [X-linked](javascript:JumpTo('#X-linked')) genetically inherited red-green color blindness or deficiency.

**Diabetes** an inherited metabolic disorder in which there are abnormally high blood sugar levels. In advanced stages, this often results in blindness from cataracts, nerve damage, gangrene in the feet and legs leading to amputation, heart disease, and kidney failure. Type 1 diabetes melitis (juvenile onset diabetes) is due to decreased production of insulin by the pancreas. Type 2 diabetes melitis is due to increased resistance of cells in the body to insulin.

**DNA** (deoxyribonucleic acid ) a large organic molecule that stores the genetic code for the synthesis of [proteins](javascript:JumpTo('#protein')). Each [chromosome](javascript:JumpTo('#chromosome')) consists mostly of a DNA molecule. DNA is composed of sugars, phosphates and bases arranged in a [double helix](javascript:JumpTo('#double_helix')) shaped molecular structure. Segments of DNA correspond to specific [genes](javascript:JumpTo('#gene')).

**Down syndrome** a genetically inherited form of mental retardation usually resulting from the inheritance of an extra [autosome](javascript:JumpTo('#autosome')) 21. Down syndrome individuals also typically are short and stocky in build with short appendages. They usually have broad round faces, saddle-shaped nose profiles, and thick tongues that are often stuck out of their mouths. The incidence of Down syndrome children goes up rapidly with the age of the mother, particularly after 40.

**ecological niches** specific micro-habitats in nature to which populations or organisms adapt. They are usually seen in terms of being food getting opportunities in the environment.

**Epilepsy** a usually recurrent disorder of the brain characterized by abnormal electrical activity which causes mental and physical dysfunction. In serious cases, there are convulsions and unconsciousness when seizures occur.

**Evolution** genetic change in a [population](javascript:JumpTo('#population')) of organisms that occurs over time. The term is also frequently used to refer to the appearance of a new species. More specifically, it is change in the frequencies of alleles in a population's [gene pool](javascript:JumpTo('#gene_pool')) from one generation to the next.

**fertilization** the process of sexual reproduction by which the [chromosomes](javascript:JumpTo('#chromosome')) from a [sperm](javascript:JumpTo('#sperm')) cell enter the nucleus of an [ovum](javascript:JumpTo('#ovum')) and combine with its chromosomes to create a [zygote](javascript:JumpTo('#zygote')).

**frequency**

the number of times that something happens. For example, the number of people out of 100 who get divorced would be the frequency of divorce.

**Gametes** reproductive cells--[sperm](javascript:JumpTo('#sperm')) or unfertilized [ovum](javascript:JumpTo('#ovum')) cells produced in the testes and ovaries of animals. Gametes are produced by [meiosis](javascript:JumpTo('#meiosis')). They normally have half the number of [chromosomes](javascript:JumpTo('#chromosome')) found in [somatic](javascript:JumpTo('#somatic_cell')) cells.

**Genes** units of inheritance usually occurring at specific locations, or loci, on a [chromosome](javascript:JumpTo('#chromosome')). Physically, a gene is a sequence of [DNA](javascript:JumpTo('#DNA')) bases that specify the order of amino acids in a protein or, in some cases, a small [RNA](javascript:JumpTo('#RNA')) molecule referred to as a microRNA. A gene may be made up of hundreds to thousands of DNA bases. Genes are responsible for hereditary characteristics.

**gene flow** the transference of [genes](javascript:JumpTo('#gene')) from one population to another, usually as a result of migration. The loss or addition of individuals can easily change the [gene pool](javascript:JumpTo('#gene_pool')) frequencies of both the recipient and donor populations--that is, they can evolve.

**gene pool** the sum of all of the [alleles](javascript:JumpTo('#allele')) of genes in all of the individuals in a [population](http://anthro.palomar.edu/synthetic/glossary.htm#population).

**genetic drift** evolution, or change in gene pool frequencies, resulting from random chance. Genetic drift occurs most rapidly in small populations. In large populations, random deviations in allele frequencies in one direction are more likely to be cancelled out by random changes in the opposite direction.

**genetic** **load** a measure of all of the harmful recessive alleles in a population or family line. A high genetic load would be one in which there is a high frequency of deleterious recessive alleles.

**genetic equilibrium** the situation in which a population is not evolving from generation to generation--that is, the population's [gene pool](javascript:JumpTo('#gene_pool')) frequencies remain unchanged.

**genome** the full genetic complement of an individual (or a species). In humans, it is estimated that each individual possesses approximately 2.9 billion nucleotides in all of the [DNA](javascript:JumpTo('#DNA')) that makes up his or her genome.

**Genotype** the genetic makeup of an individual. Genotype can refer to an organism's entire genetic makeup or the [alleles](javascript:JumpTo('#allele')) at a particular locus. See [phenotype](javascript:JumpTo('#phenotype')).

**HIV** the virus that is responsible for causing [AIDS](javascript:JumpTo('#AIDS')).

**Inbreeding**

**inbreeding depression** The reduction in viability and subsequent loss of reproductive potential of purebred varieties. This is a consequence of a pattern of [consanguineous mating](javascript:JumpTo('#consanguineous_mating')) that goes on for many generations in a family line or a small inbred population.

**Meiosis** the cell division process in specialized tissues of female ovaries and male testes which results in the production of sex cells, or gametes. Meiosis involves two divisions and produces four [sperm](javascript:JumpTo('#sperm')) cells in males and one [ovum](javascript:JumpTo('#ovum')) in females from a starting cell. Each sperm and ovum contains only half the original number of chromosomes--23 in the case of humans. Subsequently, meiosis is also called "reduction division." Spermatogenesis is the term used for meiosis in males and oögenesis refers to the same process in females. See [mitosis](javascript:JumpTo('#mitosis')).

**Mitosis** the simple cell division process that occurs in [somatic cells](javascript:JumpTo('#somatic_cell')). One cell divides into two offspring cells that are identical to each other in their chromosome complement. Mitosis produces cells with [diploid numbers](javascript:JumpTo('#diploid_number')) of chromosomes--46 in the case of humans. See [meiosis](javascript:JumpTo('#meiosis')).

**Mutation an alteration of genetic material such that a new variation is produced. For instance, a trait that has only one** [allele](javascript:JumpTo('#allele')) **(A) can mutate to a new form (a). This is the only mechanism of** [evolution](javascript:JumpTo('#evolution')) **that can produce new alleles of a gene. Technically, mutation refers to changes in DNA bases as well as changes in chromosome number and /or structure. See** [mutagen](javascript:JumpTo('#mutagen'))

**natural selection** an evolutionary mechanism that occurs when some individuals of a population are better able to adapt to their environment and, subsequently, produce more offspring. Nature, in effect, selects which members of a population are fit to survive long enough to reproduce. Differential productive success between individuals is the key. Those who produce more offspring have a greater influence on the gene frequencies of the next generation. This mechanism of evolutionary change was first articulated by Charles Darwin.

**non-random mating** mate selection based on one or more traits that are discriminated for or against. This is a mechanism of evolution. See [positive assortative](javascript:JumpTo('#positive_assortative_mating')), [negative assortative](javascript:JumpTo('#negative_asortative_mating')), and [random mating](javascript:JumpTo('#random_mating')).

**nucleic acids** the largest type of molecule in living organisms. It is composed of a chain of [nucleotides](http://anthro.palomar.edu/synthetic/glossary.htm#nucleotide) that code for the synthesis of specific [proteins](javascript:JumpTo('#protein')). [DNA](javascript:JumpTo('#DNA')) and [RNA](javascript:JumpTo('#RNA')) are types of nucleic acid.

**Ovum a female sex cell or** [gamete](javascript:JumpTo('#gamete'))

**population** a more or less distinct group of individuals within a [species](javascript:JumpTo('#species')) who are reproductively isolated from other groups. In other words, they restrict their mate selection to members of their own population. This is usually due to geographic and/or social barriers to mating with outsiders. Members of a completely isolated small population tend to have similar genetic characteristics due to generations of inbreeding.

**population genetics** the study of biological inheritance patterns and changing [gene pool](javascript:JumpTo('#gene_pool')) frequencies in [populations](javascript:JumpTo('#population')) largely through the determination of [allele](javascript:JumpTo('#allele')) frequencies. Population geneticists also identify processes resulting in [evolution](javascript:JumpTo('#evolution')). See [synthetic theory of evolution](javascript:JumpTo('#synthetic_theory_of_evolution')).

**Proteins** any of a large number of complex organic molecules that are composed of one or more chains of [amino acids](javascript:JumpTo('#amino_acid')). Proteins can serve a wide variety of functions through their ability to bind to other molecules. Proteins may be enzymes, hormones, antibodies, structural components, or gas-transporting molecules

**RNA ribonucleic acid** a type of [nucleic acid](javascript:JumpTo('#nucleic_acid')) that is found in both the nucleus and the cytoplasm of cells. Unlike [DNA](javascript:JumpTo('#DNA')), RNA is single stranded. Messenger RNA (mRNA) carries the genetic code from the DNA in the [chromosomes](javascript:JumpTo('#chromosome')) and translates it with the help of transfer RNA (tRNA) at the site of the ribosomes in the cytoplasm in order to assemble, or synthesize, [proteins](javascript:JumpTo('#protein')).

**sex cell** a [gamete](javascript:JumpTo('#gamete')), either a [sperm](javascript:JumpTo('#sperm')) or an [ovum](javascript:JumpTo('#ovum')). Sex cells are produced by the [meiosis](javascript:JumpTo('#meiosis')) process. See [somatic cell](javascript:JumpTo('#somatic_cell')).

**sickle-cell trait** a genetically inherited [recessive](javascript:JumpTo('#recessive_allele')) condition in which some or all of the red blood cells are abnormally distorted to a sickle shape. Symptoms include pain and severe anemia as well as heart, lung, and kidney problems. People who are heterozygous for this trait rarely have these debilitating and ultimately fatal problems but do have a high degree of immunity to malaria. Sickle cell trait is at its highest frequency among Central African populations and among people whose ancestors came from that region. Sickle-cell trait is often referred to as sickle-cell anemia.

**Species** the largest natural population of organisms that can potentially interbreed to produce fertile offspring. It is commonly assumed that members of one species are reproductively isolated from members of all other species (i.e., they cannot mate with them to produce fertile offspring). However, we must be cautious in defining species with this criterion because members of very closely related species can sometimes produce offspring together, and a small fraction of those may be fertile to some degree. This is the case with mules, which are the product of mating between horses and donkeys. About one out of 10,000 mules is fertile. This suggests that some species differences are a matter of degree.

**Sperm** a male sex cell or [gamete](javascript:JumpTo('#gamete')).

**Zygote** a "fertilized" [ovum](javascript:JumpTo('#ovum')). More precisely, this is a cell that is formed when a [sperm](javascript:JumpTo('#sperm')) and an ovum combine their [chromosomes](javascript:JumpTo('#chromosome')) at conception. A zygote contains the full complement of chromosomes (in humans 46) and has the potential of developing into an entire organism.