G

G0 phase: a cell-cycle phase distinct from the G1 phase of interphase; a cell in G0 is not preparing to divide

G1 phase: (also, first gap) a cell-cycle phase; the first phase of interphase centered on cell growth during mitosis

G2 phase: (also, second gap) a cell-cycle phase; third phase of interphase where the cell undergoes the final preparations for mitosis

gamete: a haploid reproductive cell or sex cell (sperm or egg)

gap junction: a channel between two adjacent animal cells that allows ions, nutrients, and other low-molecular-weight substances to pass between the cells, enabling the cells to communicate

gene expression: processes that control whether a gene is expressed

gene flow: the flow of alleles in and out of a population due to the migration of individuals or gametes

gene pool: all of the alleles carried by all of the individuals in the population

gene: the basic unit of heredity; a sequence of DNA that codes for a specific peptide or RNA molecule

genetic code: the amino acids that correspond to three-nucleotide codons of mRNA

genetic drift: the effect of chance on a population's gene pool

genome: the entire genetic complement (DNA) of an organism

genotype: the underlying genetic makeup, consisting of both physically visible and non-expressed alleles, of an organism

germline cell: specialized cell line that produces gametes, such as eggs or sperm

glycocalyx: a fuzzy-appearing coating around the cell formed from glycoproteins and other carbohydrates attached to the cell membrane.

glycogen: a storage carbohydrate in animals

glycolipid: a combination of carbohydrates and lipids

glycolysis: the process of breaking glucose into two three-carbon molecules with the production of ATP and NADH

glycoprotein: a combination of carbohydrates and proteins

golgi apparatus: a eukaryotic organelle made up of a series of stacked membranes that sorts, tags, and packages lipids and proteins for distribution

granum: a stack of thylakoids located inside a chloroplast

guard cells: specialized plant cells that control the opening and closing of the stomata

H

haploid: describes a cell, nucleus, or organism containing one set of chromosomes (n)

Hardy-Weinberg equilibrium: a principle that states a population's allele and genotype frequencies are inherently stable unless evolutionary force(s) is acting on the population

heat energy: the energy transferred from one system to another that is not work

helicase: an enzyme that helps to open up the DNA helix during DNA replication by breaking the hydrogen bonds

heterotroph: an organism that cannot make its own food and must consume other organisms to obtain its energy

heterotroph: an organism that cannot make its own food and must consume other organisms to obtain its energy

heterotroph: an organism that consumes other organisms for food

heterozygous: having two different alleles for a given gene on the homologous chromosomes

homeostasis: the ability of an organism to maintain constant internal conditions

homologous chromosomes: the randomness of how the homologous chromosome pairs align at the metaphase plate during metaphase I of meiosis I

homologous structure: a structure that is similar because of descent from a common ancestor

homozygous: having two identical alleles for a given gene on the homologous chromosomes

hormone: a chemical signaling molecule, usually a protein or steroid, secreted by an endocrine gland or group of endocrine cells; acts to control or regulate specific physiological processes

hybridization/cross-fertilization: the process of mating two individuals that differ, to achieve a certain characteristic in their offspring

hydrocarbon: organic molecules consisting entirely of carbon and hydrogen

hydrogen bond: a weak bond between partially positively charged hydrogen atoms and partially negatively charged elements or molecules

hydrolysis reactions: a reaction where a water molecule (and usually an enzyme) is used to break a chemical bond within a polymer

hydrophilic: describes a substance that dissolves in water; water-loving

hydrophobic: describes a substance that does not dissolve in water; water-fearing

hypertonic: describes a solution in which extracellular fluid has a higher osmolarity than the fluid inside the cell

hypothesis: a testable explanation to a scientific question

hypotonic: describes a solution in which extracellular fluid has a lower osmolarity than the fluid inside the cell

I

incomplete dominance: in a heterozygote, expression of two contrasting alleles such that the individual displays an intermediate phenotype

independent assortment: describing something composed of genetic material from two sources, such as a chromosome with both maternal and paternal segments of DNA

independent variable: is the variable that is being altered or changed by the researcher; it is the variable being tested

inductive reasoning: a form of logical thinking that uses related observations to arrive at a general conclusion

inheritance of acquired characteristics: a phrase that describes the mechanism of evolution proposed by Lamarck in which traits acquired by individuals through use or disuse could be passed on to their offspring thus leading to evolutionary change in the population

integral protein: protein integrated into the membrane structure that interacts extensively with the membrane lipids' hydrocarbon chains and often spans the membrane

interkinesis: a period of rest that may occur between meiosis I and meiosis II; there is no replication of DNA during interkinesis

intermediate filaments: fibers of the cytoskeleton that are of intermediate diameter and have structural functions, such as maintaining the shape of the cell and anchoring organelles

interphase: the period of the cell cycle leading up to mitosis; includes G1, S, and G2 phases; the interim between two consecutive cell divisions

intron: non–protein-coding intervening sequences that are spliced from mRNA during processing

inversion: the detachment, 180° rotation, and reinsertion of a chromosome arm

ion: an atom or compound that does not contain equal numbers of protons and electrons, and therefore has a net charge

ionic bond: a chemical bond that forms between ions of opposite charges

isomers: molecules that share the same chemical formula but differ in the placement (structure) of their atoms and or chemical bonds

isotonic: describes a solution in which the extracellular fluid has the same osmolarity as the fluid inside the cell

isotope: one or more forms of an element that have different numbers of neutrons