C

Calvin cycle: the reactions of photosynthesis that use the energy stored by the light-dependent reactions to form glucose and other carbohydrate molecules

carbohydrate: a biological macromolecule in which the ratio of carbon to hydrogen to oxygen is 1:2:1; carbohydrates serve as energy sources and structural support in cells

carriers: a heterozygous individual who does not display symptoms of a recessive genetic disorder but can transmit the disorder to his or her offspring

catabolic: describes the pathway in which complex molecules are broken down into simpler ones, yielding energy as an additional product of the reaction

catalyst: substances that speed up the rate of chemical reactions

cation: a positive ion formed by losing electrons

cell cycle checkpoints: mechanisms that monitor the preparedness of a eukaryotic cell to advance through the various cell cycle stages

cell cycle: the ordered sequence of events that a cell passes through between one cell division and the next

cell plate: a structure formed during plant-cell cytokinesis by Golgi vesicles fusing at the

cell theory: the biological concept that states that all organisms are composed of one or more cells, the cell is the basic unit of life, and new cells arise from existing cells

cell wall: a rigid cell covering made of cellulose in plants, peptidoglycan in bacteria, non-peptidoglycan compounds in Archaea, and chitin in fungi that protects the cell, provides structural support and gives shape to the cell

cell: the smallest fundamental unit of structure and function in living things

cellulose: a polysaccharide that makes up the cell walls of plants and provides structural support to the cell

Central dogma: The flow of genetic information in cells from DNA to mRNA to protein

central vacuole: a large plant cell organelle that acts as a storage compartment, water reservoir, and site of macromolecule degradation

centrosomes: specialized microtubules that pull chromosomes to their poles during cell division and also give rise to the mitotic spindle

characteristic: different heritable, physical features

chemical bond: an interaction between two or more of the same or different elements that result in the formation of molecules

chemical energy: type of potential energy that exists within chemical bonds

chemical reactions: occur when two or more atoms bond together to form molecules or when bonded atoms break apart

chemiosmosis: the movement of hydrogen ions down their electrochemical gradient across a membrane through ATP synthase to generate ATP

chemoautotrophs: an organism capable of producing its own food by extracting energy from inorganic chemical compounds

chiasmata: (singular = chiasma) the structure that forms at the crossover points after genetic material is exchanged

chitin: a type of carbohydrate that forms the outer skeleton of arthropods, such as insects and crustaceans, and the cell walls of fungi

chlorophyll a: the form of chlorophyll that absorbs violet-blue and red light

chlorophyll b: the form of chlorophyll that absorbs blue and red-orange light

chlorophyll: the green pigment that captures the light energy that drives the reactions of photosynthesis

chloroplast: a plant cell organelle that carries out photosynthesis

cholesterol: a lipid that plays an important role in membrane fluidity

chromatin: DNA wound around proteins forming long fiber-like strands

Chromosomal Theory of Inheritance: a theory proposing that chromosomes are the genes' vehicles and that their behavior during meiosis is the physical basis of the inheritance patterns that Mendel observed

chromosome: structures made of chromatin that are visible when the cell is dividing

cilium: (plural: cilia) a short, hair-like structure that extends from the plasma membrane in large numbers and is used to move an entire cell or move substances along the outer surface of the cell

citric acid cycle: a series of enzyme-catalyzed chemical reactions of central importance in all living cells that harvest the energy in carbon-carbon bonds of sugar molecules to generate ATP; the citric acid cycle is an aerobic metabolic pathway because it requires oxygen in later reactions to proceed

cleavage furrow: a constriction formed by the actin ring during animal-cell cytokinesis that leads to cytoplasmic division

codominance: in a heterozygote, complete and simultaneous expression of both alleles for the same characteristic

codon: three consecutive nucleotides in mRNA that specify the addition of a specific amino acid or the release of a polypeptide chain during translation

coenzyme: small organic molecules, such as a vitamin or its derivative, which is required to enhance an enzyme's activity

cofactor: inorganic ion, such as iron and magnesium ions, required for optimal enzyme activity regulation

cohesion: the intermolecular forces between water molecules caused by the polar nature of water; creates surface tension

community: a set of populations inhabiting a particular area

competitive inhibition: a general mechanism of enzyme activity regulation in which a molecule other than the enzyme's substrate can bind the active site and prevent the substrate itself from binding, thus inhibiting the overall rate of reaction for the enzyme

complete dominance: in a heterozygote the dominant allele masks the effect of the recessive allele

compound: are made up of different types of atoms held together by chemical bonds

concentration gradient: an area of high concentration across from an area of low concentration

continuous variation: a variation in a characteristic in which individuals show a range of traits with small differences between them

control: a part of an experiment that does not change during the experiment

convergent evolution: an evolution that results in similar forms on different species

covalent bond: a type of strong bond between two or more of the same or different elements; forms when electrons are shared between elements

crossing over: (also, recombination) the exchange of genetic material between homologous chromosomes resulting in chromosomes that incorporate genes from both parents of the organism forming reproductive cells

cytokinesis: the division of the cytoplasm following mitosis to form two daughter cells

cytoplasm: the entire region between the plasma membrane and the nuclear envelope, consisting of organelles suspended in the gel-like cytosol, the cytoskeleton, and various chemicals

cytoskeleton: the network of protein fibers that collectively maintain the shape of the cell, secures some organelles in specific positions, allows cytoplasm and vesicles to move within the cell, and enables unicellular organisms to move

cytosol: the gel-like material of the cytoplasm in which cell structures are suspended

deductive reasoning: a form of logical thinking that uses a general statement to forecast specific results

D

dehydration synthesis: a reaction where monomers combine with the help of water (and often an enzyme) to form polymers

deletion: a part of a chromosome is lost or removed

denaturation: loss of shape in a protein that may be a result of changes in temperature, pH, or chemical exposure

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deoxyribonucleic acid (DNA): a double-stranded polymer of nucleotides that carries the hereditary information of the cell