

Fundamental Plant Processes

Photosynthesis

process of converting light energy to chemical energy and storing it in the bonds of sugar

The Cell Cycle

ordered set of events resulting in cell growth and division into two daughter cells

Interphase

phase of the cell cycle in which a cell spends the majority of its time and performs most of its normal functions in preparation for cell division

Gap 1 Phase

also known as G_1 phase; phase in which the cell grows, carries out protein synthesis and performs other cellular functions

Synthesis Phase

also known as S phase; phase in which the cell replicates its DNA

Gap 2 Phase

also known as G_2 phase; growth phase which allows cells to continue to carry out normal functions and continue growing

Mitosis

also known as M phase; process by which new cells are created and results in two daughter nuclei, each with genetic material identical to each other and the mother cell

Prophase

first stage of mitosis

Chromosome

single piece of coiled DNA which contains many genes, regulatory elements and other nucleotide sequences

Centrosome

area in the cell where microtubules are produced

Mitotic Spindle

fibers which form during mitosis and segregate chromosomes between daughter cells during cell division

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Chromatid

one copy of a duplicated chromosome which is usually joined to the other copy by a centromere

Centromere

region of DNA typically found in the center of a chromosome which links two sister chromatids

Metaphase

second stage of mitosis

Anaphase

third stage of mitosis

Telophase

fourth stage of mitosis

Cytokinesis

process which occurs after mitosis where the cell splits and two daughter cells are created, each with one nucleus

Germination

process by which a plant grows from a seed

Endosperm

tissue produced inside the seeds of most flowering plants which surrounds the embryo and provides nutrition in the form of starch, oils and protein

Cotyledon

first embryonic leaf (leaves) of a seedling which emerge at the time of germination

Radicle

first root of the plant which elongates during germination and forms the primary root

Respiration

process by which a cell releases energy by breaking down glucose and other food molecules in the presence of oxygen

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Turgor Pressure

also known as turgidity; pressure which occurs when the water located inside the cells begins to expand, pushing on the cell membranes

Stomata

pores found on the surface of plant structures which control the exchange of gas and water

Plant Growth Regulator

natural or synthetic organic compound which modifies or controls one or more specific physiological processes within a plant

Phytohormone

organic compounds produced within the plant

Apical Dominance

control of the shoot tip over axillary bud outgrowth which allows a plant to grow upward more than it grows outward

Phototropism

growth of plants in response to light

Senescence

condition or process of aging

Diffusion

movement of dissolved substances from areas of high concentration to areas of low concentration

Osmosis

diffusion of water across a semipermeable membrane from areas of high concentration to areas of lower concentration

Semipermeable Membrane

membrane which allows water molecules, but not solute molecules, to pass

Hypotonic Solution

solute concentration is lower outside of the cell than inside

Hypertonic Solution

solute concentration is greater outside of the cell than inside

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Flaccid

plant cell which is limp through a reduction of pressure inside the cell

Plasmolysis

process in which cells lose water in a hypertonic solution

Isotonic Solution

solute concentration is the same on either side of the cell membrane and results in incipient plasmolysis

Photosynthate

chemical product of photosynthesis

Adenosine Triphosphate (ATP)

transports chemical energy within cells for metabolism

Stroma

connective, functionally supportive framework of a biological cell, tissue or organ

Calvin Cycle

metabolic pathway found in the stroma of the chloroplast in which carbon enters in the form of CO_2 and leaves in the form of sugar

Mitochondria

membrane-bound organelle found in eukaryotic cells which generate most of the cell's supply of ATP which is used as energy

Pyruvate

compound formed as a result of glycolysis

Transpiration

loss or evaporation of water from plant leaves through stomata

Guard Cells

specialized cells which help regulate the rate of transpiration by opening and closing the stomata