

Biology Cheatsheet

Cell Biology

Organelles

Organelle	Description
Nucleus	Contains genetic material (DNA)
Mitochondria	Site of cellular respiration
Ribosomes	Site of protein synthesis
Endoplasmic reticulum (ER)	Network of membranes for protein folding and transport
Golgi apparatus	Modifies, sorts, and packages proteins and lipids
Lysosome	Contains enzymes for breaking down cellular waste

Cell Cycle

1. G1 (gap 1) phase: Growth and normal cell functions
2. S phase: DNA replication
3. G2 (gap 2) phase: Growth and preparation for cell division
4. M (mitotic) phase: Cell division (mitosis and cytokinesis)

Genetics

Mendelian Genetics

- Law of segregation: Each individual has two alleles for each gene, and they segregate (separate) during gamete formation
- Law of independent assortment: Genes on different chromosomes assort independently during gamete formation
- Dominant alleles are expressed over recessive alleles

DNA Structure

- DNA (deoxyribonucleic acid) is composed of nucleotides
- Nucleotides consist of a sugar molecule (deoxyribose), a phosphate group, and a nitrogenous base (adenine, thymine, cytosine, or guanine)
- DNA is double-stranded and complementary (A-T, C-G)

DNA Replication

1. Helicase unwinds and separates the DNA strands.
2. Primase adds RNA primers to the template strand.
3. DNA polymerase synthesizes a new strand of DNA in the 5' to 3' direction.
4. DNA ligase seals the gaps between Okazaki fragments on the lagging strand.

Ecology

Levels of Organization

1. Organism: An individual living thing
2. Population: A group of individuals of the same species in a particular area
3. Community: All the different species in a particular area
4. Ecosystem: The community and the abiotic factors (non-living components) in a particular area
5. Biome: A group of similar ecosystems with the same climate and dominant vegetation
6. Biosphere: The sum of all the biomes on Earth

Symbiosis

- Mutualism: Both organisms benefit from the interaction
- Commensalism: One organism benefits, and the other is not affected
- Parasitism: One organism benefits, and the other is harmed

Succession

- Primary succession: Succession on newly exposed surfaces that have no soil
- Secondary succession: Succession that occurs after a disturbance (e.g., fire, flood) has removed some or all of the previous organisms

Resources

- Khan Academy: <https://www.khanacademy.org/science/biology>
- Crash Course Biology: <https://www.youtube.com/playlist?list=PL3EED4C1D684D3ADE>
- Biology Dictionary: <https://www.biologydictionary.net/>
- Biology Online: <https://www.biologyonline.com/>