Biology Placement Exam Study Resources

What Topics will the Biology Placement Exam Cover?

Basic Chemistry - Composition of Matter

A. Matter and Energy
    1. Atomic Structure
    2. Identifying Elements
    3. Radioisotopes
B. Molecules and Mixtures
    1. Molecules and Compounds
    2. Mixtures
    3. Distinguishing Mixtures from Compounds
    4. pH
C. Chemical Bonds
    1. The role of electrons in chemical bonding
    2. Types of chemical bonds
D. Chemical Reactions
    1. Chemical equations
    2. Patterns of chemical reactions
    3. Energy flow in chemical reactions
    4. Reversibility of chemical reactions
    5. Factors influencing the rate of chemical reactions
E. Inorganic Compounds
    1. Water, salts, acids and bases
F. Organic Compounds
    1. Structure/Function relationships
    2. Carbohydrates, lipids, proteins, nucleic acids (DNA and RNA)
    3. Adenosine Triphosphate

Cellular Biology

A. Types of Cells
    1. Prokaryotic
    2. Eukaryotic
B. Structure of plasma membrane
    1. The Fluid Mosaic model
    2. Special functions
C. Functions of the plasma membrane
    1. Membrane transport
    2. Generating and maintaining a resting membrane potential
    3. Cell environment interactions
D. The cytoplasm

        1. Cytoplasmic organelles
        2. Cellular extensions
    E. The Nucleus
        1. The nuclear envelope
        2. Nucleoli
        3. Chromatin
    F. Cell growth and reproduction
        1. The cell life cycle
        2. Protein synthesis
        3. Other roles of DNA
        4. Cytosolic Protein degradation

Evolution

1. Natural Selection

Mendelian Genetics

1. Monohybrid Crosses
2. Dihybrid Crosses
3. Genotype vs. Phenotype
4. DNA Replication
5. Protein Synthesis

Cellular Respiration

1. Glycolysis
2. Transition Stage
3. Kreb Cycle
4. Electron Transport Cycle

Photosynthesis

1. Light Reaction
2. Calvin Cycle

Cell Communication

1. Autocrine
2. Paracrine
3. Endocrine

Study Resources

Online Videos

Khan Academy Crash Course: Biology

BIO 111 material

- Why Carbon is a tramp
- Water-liquid awesome
- Biological molecules-you are what you eat
- Eukaryopolis-The city of animal cells
- In da club- membranes & transport
- Plant cells
- ATP & respiration
- Photosynthesis
- Heredity
- DNA structure and replication
- DNA, hot pockets, & the longest word ever
- Mitosis: Splitting up is complicated
- Meiosis: Where the sex starts

For a more in depth review: Khan Academy Chemistry Videos

Atoms, Molecules and Ions

- Elements and Atoms
- Introduction to the atom
- Atomic number, mass number, and isotopes
- Atomic weight and atomic mass
- Atomic Mass

Introduction to the Periodic Table
Types of Chemical Bonds

- Ionic, covalent and metallic bonds
- Electronegativity
- Electronegativity and bonding

States of Matter

- States of Matter
- Van der Waals forces

Acids & Bases

- Acid base introduction
- Acid-base definitions
- Definition of pH
- Strong acids and strong bases
- pH of weak acid
- pH of weak base
- Acid-base properties of salts

Khan Academy Biology Videos: Introduction to cells

- Diffusion & Osmosis
- Nuclei, membranes, ribosomes, eukaryotes and prokaryotes
- Endoplasmic reticulum and Golgi
- Organelle Overview
- Chromosomes, chromatids, chromatin etc.

Introduction to Cell Division

- Fertilization terminology: gametes, zygotes, haploid and diploid
- Zygote differentiating into somatic and germ cells

Mitosis

- Interphase
- Mitosis
- Phases of Mitosis
- Mitosis Questions

Meiosis

- Comparing mitosis and meiosis
- Chromosomal crossover in Meiosis I
- Phases of Meiosis I
- Phases of Meiosis II

Stem Cells and Cancer

- Embryonic stem cells
- Cancer

Cellular Respiration

- ATP: Adenosine triphosphate
- ATP hydrolysis mechanism
- Photosynthesis
- Photosynthesis: Light reactions 1
- Photosynthesis: Light reactions and photophosphorylation
- Photosynthesis: Calvin cycle
- Photorespiration
- C-4 photosynthesis
- CAM plants

Literature Sources

Biology for Dummies, R.F. Kratz and D.R. Siegfried, 2nd edition
ISBN: 978-0-470-59875-7

The Complete Idiot's Guide to College Biology, Emily Jane Willingham
ISBN:978-1592578481

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