

Study Guide for Placement Test in Biology/Chemistry

Chemistry:

1. Familiarize yourself with the elements as they are listed on the periodic table and be able to identify a substance as an element or a compound.
2. Review the make-up of an atom.
3. Explain what makes up the atomic number and the mass number of an element.
4. Explain what an ion and an electrolyte is.
5. Explain what an isotope is.
6. Explain the role of electrons in chemical bond formation.
7. Be able to explain the difference between an ionic, a covalent, and a hydrogen bond.
8. Define oxidation.
9. Distinguish between the solute and the solvent of a solution.
10. Be able to list the effects of hydrogen bond formation on the behavior of water.
11. Familiarize yourself with the quantum-mechanical model of the atom and know how many electrons each energy level (principal shell) can hold.
12. State the first and second Law of Thermodynamics.
13. Be able to list different forms of energy.
14. Be able to identify and describe an acid and a base.
15. Explain what pH indicates and what signifies an acidic, neutral, and basic pH.
16. Describe the role of a buffer.
17. Give the definition of an organic molecule.
18. Distinguish between dehydration synthesis and hydrolysis.
19. Give the definition of a carbohydrate.
20. Distinguish between a monosaccharide, disaccharide and polysaccharide and be able to name examples for each.
21. Familiarize yourself with the building blocks and the structure of DNA.
22. Explain the function of DNA in a cell.
23. List the building blocks of ATP.
24. Familiarize yourself with the building blocks and the 4 levels of structure in proteins.
25. Explain the terms "peptide bond" and "dipeptide".
26. Describe protein denaturation and list conditions for denaturation.
27. Describe the effects of an enzyme and explain the term "activation energy".
28. Distinguish between exergonic and endergonic chemical reactions.
29. Describe the three groups of lipids.

Biology:

1. List the steps of the scientific process in their correct order.
2. Distinguish between dependent and independent variables, constants and controls.
3. Distinguish between organic and inorganic substances.
4. Describe the make-up and functioning of enzymes.
5. Describe the levels of protein structure.
6. Define the term "protein denaturation" and list conditions which lead to protein denaturation.
7. Explain the terms "prokaryotic" or "eukaryotic" and list forms of life that represent each category.
8. Describe the relationship between molecules, organelles, cells, tissues, and organs.
9. List the properties of life.
10. List the three domains of life.
11. Compare and contrast prokaryotes and eukaryotes.
12. Describe the make-up of the cell membrane.
13. Describe the functions of cell organelles.
14. Describe the location of genes and chromosomes in the cell.
15. Describe the difference between gametes and somatic cells.
16. Describe the processes of mitosis and meiosis.
17. Define the terms "haploid" and "diploid".
18. Distinguish between autosomes and sex chromosomes.
19. Distinguish between active and passive modes of transport of materials in or out of the cell.
20. Describe diffusion, osmosis, endocytosis and exocytosis.
21. State the Central Dogma of gene expression.
22. Familiarize yourself with the processes of transcription and translation and their locations within the cell.
23. Distinguish between codon and anticodon.
24. Distinguish between hypotonic, isotonic, and hypertonic solutions.
25. Familiarize yourself with the process of aerobic cellular respiration and describe what happens during glycolysis, the citric acid cycle, and the electron transport chain.
26. List the final products of aerobic cellular respiration.