

## **REVIEW PREPARATION FOR AP BIOLOGY 2009-10**

The following Performance Assessments represent some of the basic content knowledge from the 2008-09 Biology 9 course. Incoming AP Biology students are required to review these items and be prepared for a test on them sometime during the first week of school.

### **Chemistry of Life**

1. Distinguish between atoms, elements, molecules, and compounds.
2. Identify the structure of an atom.
3. Distinguish between the subatomic particles.
4. Explain the distinction between an element and an isotope.
5. Distinguish between ionic and covalent bonds.
6. Identify the four major organic compounds as to composition and function.

### **Cells, Tissues, Organs and Systems**

1. Be able to compare and contrast a prokaryotic and eukaryotic cell in terms of structure.
2. Be able to identify the major parts of a prokaryotic cell.
3. Be able to identify the major parts of a eukaryotic cell.
4. Be able to distinguish between a cell wall and a cell (plasma) membrane.
5. Be able to identify the structure and function of all eukaryotic organelles (including the plasma membrane, and nucleus & associated structures).
6. Be able to distinguish between unicellular, colonial, and multicellular.
7. Be able to explain the concept of specialization/division of labor and its need in a multicellular organism.
8. Be able to explain the relationship between cells, tissues, organs, and systems.

### **Membrane Structure and Function**

1. Identify what materials must pass through a membrane for normal cell activity.
2. Describe the composition and structure of a living membrane.
3. Identify the types of molecules/particles which can and cannot pass through a membrane.
4. Identify the roles of membrane proteins, glycoproteins, and glycolipids.
5. Distinguish between passive and active transport.
6. Explain the role of concentration gradient in passive transport.
7. Compare and contrast the 3 conditions under which osmosis might occur and identify the results of each condition to an animal and plant cell.
8. Explain the role of a transport protein in facilitated diffusion.
9. Identify the major source of energy for active transport.
10. Explain the 2 conditions under which active transport must occur.
11. Distinguish between endocytosis and exocytosis.

### **Cell Division and Reproduction**

1. Identify the major phases of the cell cycle.
2. Distinguish between the stages of mitosis.
3. Identify the differences between plant and animal mitosis.
4. Distinguish between asexual and sexual reproduction.
5. Identify the major events of meiosis.
6. Compare and contrast mitosis and meiosis.

## **DNA Structure**

1. Compare and contrast DNA and RNA in terms of structure.
2. Identify the major components of a nucleotide.
3. Identify the major functions of DNA.
4. Distinguish between the 3 types of RNA.
5. Identify the 3 steps in DNA replication.
6. Identify the enzymes involved in DNA replication.
7. Compare and contrast the leading and lagging strands.

## **DNA, RNA, and Polypeptide Synthesis**

1. Identify the major differences between DNA and RNA.
2. Distinguish between transcription and translation.
3. Explain the 3 major steps (initiation, elongation, termination) of transcription.
4. Transcribe an RNA transcript from a given strand of DNA.
5. Explain what occurs during RNA processing.
6. Distinguish between introns and exons.
7. Identify the 3 types of RNA and their uses.
8. Distinguish between a codon and an anticodon.
9. Identify the major steps in translation.
10. Distinguish between a starter codon and stopper codon.
11. Explain what happens if there is an error in the code.

## **Genetics**

1. Identify and explain Mendel's 2 principles and 2 laws of inheritance.
2. Distinguish between genotype and phenotype.
3. Distinguish between homozygous and heterozygous.
4. Use a Punnett square to solve a monohybrid and dihybrid problem.
5. Explain how a test cross is used to determine the genotype of a dominant individual.
6. Compare and contrast 3 forms of modified dominance.
7. Explain the inheritance of gender.
8. Solve genetic problems involving gender linkage (X linkage).

## **Classification**

1. Explain the concept of species.
2. Describe how species are able to maintain separate.
3. Name and describe the three studies of classification: systematic, phylogeny, and taxonomy.
4. Distinguish between homologies and analogies.
5. Explain Linnaeus' concept of binomial nomenclature.
6. Name and distinguish between the 7 taxons of the Linnaean system: kingdom, phylum, class, order, family, genus, species.
7. Distinguish between phenetics and cladistics as methods of classifying.
8. Describe the history of the kingdom concept.
9. Identify the 5 kingdoms and the diagnostic differences between them.