

# HSA Biology Prep – Course Overview

## FIRST QUARTER

### I. Controlled Experiments

- A. Independent, Dependent and Controlled Variables

### II. Chemistry

- A. Properties of Water
- B. pH

### III. Biochemistry

- A. Carbohydrates & Lipids
- B. Proteins & Nucleic Acids
- C. Minerals & Vitamins

### BIOLOGICAL MOLECULES BENCHMARK

### IV. Cell Biology

- A. Prokaryotes vs. Eukaryotes
- B. Cell Structures

### V. Cell Transport

- A. Maintaining Homeostasis
- B. Diffusion
- C. Osmosis

### VI. Levels of Organization

- A. Unicellular vs. Multicellular
- B. Cell → Tissue → Organ → System
- C. Circulatory, excretory, skeletal, muscular, endocrine, nervous

### VII. Cell Reproduction

- A. Mitosis
- B. Binary fission
- C. Chromosomes

### CELLS & ORGANISMS BENCHMARK

### VIII. DNA and Protein Synthesis

- A. DNA & RNA
- B. Transcription & Translation
- C. Mutations

### IX. Genetic Engineering

- A. DNA Electrophoresis
- B. Recombinant DNA
- C. Cloning

### X. Genetics

- A. Meiosis & Fertilization
- B. Analyzing Genetic Crosses & Pedigrees

### INHERITANCE OF TRAITS BENCHMARK

### XI. Evolution

- A. Variation & Mutations
- B. Natural Selection & Adaptation
- C. Evidence for evolution

### EVOLUTIONARY CHANGE BENCHMARK

## END OF FIRST QUARTER

## SECOND QUARTER

### XII. Classification

- A. Prokaryote vs. Eukaryote
- B. Kingdom overview
  - 1. Characteristics

### XIII. Ecology

- A. Abiotic/Biotic Factors
- B. Biotic Relationships
  - 1. Predator-Prey
  - 2. Parasite-Host
  - 3. Mutualism
  - 4. Commensalism
- C. Transfer of Energy
  - 1. Producers
  - 2. Consumers
  - 3. Trophic Levels
- D. Succession
- E. Biogeochemical Cycles
  - 1. Water
  - 2. Nitrogen
  - 3. Carbon
- F. Factors Influencing Populations
  - 1. Invasive Species
  - 2. Transgenic Organisms
  - 3. Deforestation
  - 4. Pesticides/Pollution
  - 5. Disruption of food webs

### ORGANISMS IN THE BIOSPHERE BENCHMARK

### XIV. Supplemental BCR Writing

- A. Appendix A: Strategies for Answering Test Questions\*

### XV. Practice Content Tests

- A. Maryland High School Assessment Samples (page M-1)\*

### XVI. Core Content Overview

- A. Preparing for Maryland HSA Workbook
- B. Public Release Documents by CLG

\* Prentice Hall Maryland High School Assessment (HSA) Biology Workbook

## END OF SECOND QUARTER