MIAMI-DADE COUNTY PULIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

BIOLOGY I HONORS — COURSE CODE: 200032001

1st Nine Weeks

I. Introduction to Biology/Nature of Life**
- A. What is Biology
- B. Science in the real world

ECOLOGY (How do interactions among organisms impact the changing environment?)

II. Ecosystems (17.5)
- A. Review of community Interactions**
- B. Distribution of life in aquatic systems (17.2)
- C. Succession and changes (17.4)
- D. Predict impact from catastrophic events: Climate change, Human activity, Invasive species (17.8)

III. Populations in an ecosystem (17.5)
- A. Population dynamics and graphs
- B. Carrying capacity
- C. Limiting Factors

IV. Energy Flow (17.9)
- A. Food Chains and Food Webs
- B. Trophic levels and energy reduction
- C. Biogeochemical Cycles: water, carbon, and nitrogen (E.7.1, 18.12)

V. Human Impact on Environment (17.20)
- A. Costs and benefits of renewable and non-renewable resources (17.11)
- B. Sustainability and environmental policy (17.11)

EVOLUTION (How do scientists think life began and continues to change on Earth?)

VI. Origins of Life (15.8)
- A. Law vs. theories in science
- B. Contribution of scientists (Pasteur, Oparin, Miller and Urey, Margulis, Fox)
- C. Endosymbiotic theory (conceptual)
- D. Role of amino acids and proteins (18.1)

VII. Theory of Evolution (15.1)
- A. Evidence for the theory of evolution
- B. Trends in human evolution: brain size, jaws, tools (15.10, 14.26)
- C. Brain structures (14.26)

VIII. Mechanisms of Evolution (15.13)
- A. Darwin's Natural Selection
- B. Introduction to other Mechanisms (15.14, 15.15)

2nd Nine Weeks

CLASSIFICATION (Why do scientists classify living things the way they do?)

IX. Taxonomy (15.6)
- A. Hierarchical classification based on evolutionary relationships (15.4)
- B. Domains and Kingdoms (15.6)
- C. Reasons for changes in how organisms are classified. (15.5)

X. What defines a plant (14.7)
- A. Overview of Plants: Organs, tissues, evolution (14.7)
- B. Physiological Processes of Plants (Growth, Reproduction, Transpiration, Photosynthesis, Cellular respiration) (14.7)
- C. Properties of Water (18.12)

XI. Cell energy: Photosynthesis (18.9)
- A. General equation of Photosynthesis (18.7)
- B. Where it occurs(14.7)
- C. Non plant examples of photosynthetic organisms (15.6)
- D. Role of carbohydrates as a source of energy (18.1)

XII. Cell energy: Cellular Respiration (18.9)
- A. General Equation for Cellular Respiration(18.8, 18.9)
- B. ADP/ATP cycle(18.10)
- C. Aerobic vs. Anaerobic respiration (18.8)
- D. Krebs cycle and Electron Transport Chain (Aerobic Respiration)**

HUMAN BODY (How are human body systems different?)

XIII. Circulatory System (14.36)
- A. Factors affecting blood pressure, blood volume, blood flow and viscosity

XIV. Immune System (14.52)
- A. Specific and non-specific responses
- B. Significance of factors: genetic, environmental, and pathogenic
- C. Use of antibiotics and vaccines
- D. Antibiotic resistance

REPRODUCTION (How do organisms grow and reproduce?)

XV. Human Reproductive system (16.13)
- A. Basic Anatomy and Physiology: male and female
- B. Human Development – Fertilization to Birth (all stages)
- C. External Membranes

3rd Nine Weeks

XVI. Review of Cells (14.1, 14.3)
- A. Cell theory and discovery (14.1)
- B. Compare/contrast cell types(14.3)(prokaryote, eukaryotic, plant, animal)
- C. Organelles and membrane: roles and functions
- D. Role of lipids in cell membrane (18.1)
- E. Role of membrane: Highly selective barrier (14.2)

XVII. Comparing Cell Processes: Mitosis (16.17)
- A. Cell Cycle (16.14)
- B. Process of Mitosis (16.14)
- C. Mistakes in Mitosis (16.8)
- D. Asexual vs. sexual effect on genetic variation

XVIII. Comparing Cell Processes: Meiosis (16.17)
- A. Process: creating gametes and independent assortment (16.16)
- B. Crossing over and non-disjunction(16.16)
- C. Genetic variation resulting from meiosis (16.15)
- D. Comparison of Mitosis and Meiosis (16.17)

GENETICS (How do inherited traits lead to variations?)

XIX. Review Heredity - Mendelian (16.1)
- A. Law of segregation and independent assortment (16.1)
- B. Other patterns of inheritance: co-dominance, incomplete dominance, polygenic, sex-linked, multiple alleles (16.2)
- C. Punnett Squares: Mono-,Dihybrid (16.1)
- D. Predict and analyze pedigrees
- E. Genetic Drift/Gene flow (15.14)

XX. Biotechnology (16.10)
- A. Predicting impact on society, individual, and environment (16.10)
- B. Medical and ethical issues(16.10)
- C. DNA Technology and recombinant DNA (16.12)

MOLECULAR GENETICS (How does your genetic code determine an organism's physical appearance?)

XXI. DNA and Replication (16.3)
- A. Experiments and History**
- B. Universal code for all organisms (16.9)
- C. Review of structure of DNA and chromosomes and location in cell**
- D. Role of Nucleic acids (18.1)
- E. DNA Replication in prophase (16.3, 16.17)
- F. Types of mutations and effects (16.4)

XXII. RNA and Protein Synthesis (16.3)
- A. RNA synthesis: Transcription (16.5)
- B. Protein synthesis: Translation (16.5)
- C. Types of mutations: harmful, beneficial, variation, neutral (16.4)

4th Nine Weeks

BIOCHEMISTRY (What are the basic building blocks)

XXIII. Review of macromolecules (18.1)
- A. Types (carbohydrates, proteins, lipids, and nucleic acids)
- B. Structure and function

XXIV. Role of Proteins in the Body: Enzymes (18.11)
- A. As a catalyst to reduce activation energy
- B. Factors affecting enzyme function: pH, temperature, concentration

XXV. *BIOLOGY EOC AA BENCHMARKS CRUNCH TIME (3 weeks)*

FACTORS THAT AFFECT HUMAN HEALTH

XXVI. Pathogens: Prokaryotes, Viruses, Protists, and Fungi**

XXVII. Review of Animal Kingdom

XXVIII. Genetic Diseases and Human Genetics**

****Denotes content necessary for in depth understanding of the content matter but will not be assessed on the EOC.**