

Murrieta Valley Unified School District
High School Course Outline
October 2004

Department: Science
Course Title: Biology College Prep
Course Number: 3025
Grade Level: 9-12
Length of Course: Year

I. Goals

The student will...

- A. Become independent learners by effectively using processing skills such as: Using and interpreting tables and graphs; utilizing computer technology; and demonstrating proper laboratory skills. *(I.E. 1: a-f,j,k)*
- B. Realize that the Scientific Method proceeds by well-defined steps and includes specific criteria. *(I.E. 1: a-f)*
- C. Understand that atoms are the fundamental units of all matter, contain energy and interact with each other to form chemical organic substances. *(I: h)*
- D. Distinguish between the structures of prokaryotic and eukaryotic cells. *(CB 1:c)*
- E. Demonstrate how energy enters living things and how it is converted through the processes of photosynthesis and respiration. *(1: f,g)*
- F. Understand the processes of cell reproduction, mitosis and meiosis. *(2: a,b)*
- G. Demonstrate and apply the basic concepts of Medelian genetics. *(3: a,b; 4: a-f; 5: a-d)*
- H. Comprehend the laws of inheritance and how they apply to human traits. *(4: a-f; 5: a,b)*
- I. Understand and explain the structure and function of DNA and RNA, and their roles in producing proteins. *(5: a,b)*
- J. Understand the benefits and applications of genetic technology. *(5: a,c)*
- K. Analyze the evidence for how different life forms may have changed over time through natural selection. *(7: a-d)*
- L. Apply the concepts that organization is a result of structure and function working together to maintain homeostasis despite changes in internal and external environments. *(8: a-e)*
- M. Know the factors in an organism's surrounding environment and how energy flows through an ecosystem. *(6: a-f)*
- N. Understand the causes of fluctuation in population size in an ecosystem. *(7: a-d)*
- O. Analyze fossil evidence with regard to biological diversity. *(7: a-d)*
- P. Distinguish differences between bacteria and viruses. *(10: d)*

- Q. Understand how organisms take in nutrients and expel wastes. (**9: a**)
- R. Analyze the anatomy and physiology of the nervous, immune, and endocrine systems. (**9: a-f**)

II. Outline of Content for Major Areas of Study

Semester 1

Scientific Method, Cell Biology, and Energy Pathways

- A. Scientific Method (*1 d, f, g, k - n*)
 - 1. Steps in the scientific process
 - 2. Laboratory safety and skills
 - 3. Computer and technology integration

- B. Cell Biology (*1 a, c, e, h*)
 - 1. Atoms and their interactions
 - 2. Organic compounds
 - 3. Prokaryotic and eukaryotic cells and viruses
 - 4. Cell structures and functions

- C. Energy Pathways (*1 f, g*)
 - 1. Photosynthesis
 - 2. Cellular respiration and Fermentation

- D. Cell Reproduction
 - 1. Mitosis

Semester 2

Organisms and their changing environment

- A. Genetics (*2 a-g; 3 a-b; 4 a-f; 5 a-d*)
 - 1. Mendel's Laws and punnett squares
 - 2. Meiosis
 - 3. DNA and RNA structures
 - 4. Protein synthesis
 - 5. Mutations
 - 6. Patterns of inheritance
 - 7. Recombinant DNA

- B. Evolution (*8 a-e; 7 a-d*)
 - 1. Fossil records
 - 2. Natural selection and evidence of evolution
 - 3. Darwin
 - 4. Adaptations
 - 5. Homologous structures
 - 6. Comparative embryology
 - 7. Mechanisms of evolution
 - 8. Population genetics

9. Genetic drift
10. Speciation
11. Patterns of evolution

C. Physiology (9 a-e; 10 a-e)

1. Respiratory system
2. Bacteria and viruses
3. Immune system
4. Nervous system
5. Endocrine system

D. Ecology (6 a-f)

1. Principles of Ecology
2. Communities and Biomes
3. Population Biology
4. Biological diversity and Conservation

III. Accountability Determinants

A. Key Assignments

1. Microscope Lab
2. Enzyme Lab
3. Organic Compounds Lab
4. Cell Structure/Function Diagrams
5. Selective Permeability Lab
6. Dissection

B. Assessment Methods

1. Teacher observations of day-to-day classroom participation, effort, behavior, and achievement.
2. Individual performance on tests, portfolios, and projects.
3. Common final exam based on California Academic and Performance Standards.
4. Completion of *Biology* Content Standard Test.

IV. Required Text

Biggs, Alton., et al. *Biology The Dynamics of Life*. Columbus, Ohio: Glencoe/McGraw-Hill, 2000

V. Supplementary Texts

Miller, Kenneth R. and J. Levine. *Biology*. Englewood Cliff, New Jersey: Prentice Hall, 1991