

**Murrieta Valley Unified School District**  
**High School Course Outline**  
**October 2004**

**Department:** Science

**Course Title:** Life Science

**Course Number:** 3037

**Grade Level:** 9-12

**Length of Course:** Year

**Prerequisite:** None

**UC/CSU :** None

**I. Goals**

The student will...

- A. Strive to 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, and apply them to the structure of living things. *(1: h)*
- D. Distinguish between the structures of prokaryotic and eukaryotic cells. *(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. Understand the basic concepts of Mendelian genetics. *(. 2: a-g; 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. Have knowledge of genetic technology. *(5: a,c)*
- K. Understand how natural selection drives evolution. *(7: a-c)*
- L. Be able to relate structure and function to homeostasis in the organism. *(. 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 ways in which populations change. *(7: a-d)*
- O. Analyze fossil evidence with regard to biological diversity. *( 7: a-d)*
- P. Identify 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 (*2: a, b*)
  - 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**

Miller, Kenneth R. and J. Levine. *Biology: the Living Science*. Upper Saddle River, New Jersey: Prentice Hall, 2000

**V. Supplementary Text**

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