2008-2009 AP Biology Syllabus
Sultan High School
Mrs. O'Malley

Welcome to Mrs. O'Malley's First Ever AP Biology Class!

Don't panic, I've been to the AP Institute, had four years of college biology, taught general Biology for four years...and am very driven to make this class successful for you. Join with me on this epic year of Sultan High School's first AP Biology course! Don't be fooled by your fun Sophomore year in my general Biology class. This is the Big Time. There is a tremendous amount of material to cover and very little time available before the AP exam on May 11th, 2009. Some students accustomed to making easy A's might make B's on tests may start to doubt themselves, their teacher, and the course because they forget that they are taking a college level course with standards that are higher than usual. You will be expected to read at least an hour per night and do more independent study than you might be accustomed to.

Lab fee: $30 to help offset the cost of materials. Please pay in the office.
Text: Campbell, "Biology". 8th Edition

Supplies needed:

1. Bound composition notebook (no spiral notebooks)
2. 3-ringed binder to keep important papers like this one
3. Glue stick or tape for inserting papers into your notebook
4. Pen and pencil
5. Calculator
6. Colored pencils
7. Good work ethic
8. Positive attitude

Course Description: The Advanced Placement Biology course is designed to be the equivalent of a college introductory biology course taken by biology majors during their first year. The AP Biology course differs significantly from the usual high school biology course with respect to the kind of textbook used, the range and depth of topics covered, the kind of laboratory work performed by students, and the time and effort required of students. The textbook used will be similar to those used by college biology majors. AP Biology aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. College Board guidelines are followed in shaping the course. For more information about the course go to: http://www.collegeboard.com/student/testing/ap/sub_bio.html

Like other College Board programs, the AP program is worldwide in its scope; its policies are determined by representatives of College Board member institutions and agencies throughout the country and are implemented by the College Board. The AP Program is open to any secondary school that elects to participate. Similarly, the examinations are open to any candidate who wishes to participate. (*Advanced Placement Program)*. Prior to taking AP Biology you should have completed general biology with at least "B" or have instructor permission. A strong background in math (especially Algebra) is helpful and Chemistry is highly recommended.

Exam: All students are **required** to take the AP Biology exam from the College Board in order to receive credit in this class. The test is an extensive three-hour test as given by the College Board. The fee for this exam is $84. Fee reductions of $22 per exam are available

from the College Board for students with financial need. Scores on the official AP Biology exam from the College Board will not count toward the class grade, but may count for future college credit upon completion of the class.

Scientific Themes

Eight themes are presented in AP biology to help students connect topics and develop a greater understanding of the biological world. The following themes will be explored in each of the units presented in this course:

1. **Science as a Process** – The scientific method and inquiry are used in all aspects of biology to further current understanding of organisms and the complex systems that govern how organisms live.

2. **Evolution** – The theory of evolution is the central and unifying principal for all areas of biological science. Evolution is the process that allows organisms to adapt to their surroundings and leads to changes in species over time. Natural selection is the driving force behind evolution. The current diversity seen in life on Earth is extraordinary evidence of the evolutionary process.

3. **Energy Transfer** – All energy on Earth comes from the sun. Energy must be obtained and changed into a usable form to be used by organisms. Organisms use energy to perform the chemical reaction necessary for survival and reproduction.

4. **Continuity and Change** – All organisms seek to continue their species by passing on genetic information thought reproduction. Asexual and sexual reproduction are the two methods responsible for ensuring continuity between generations. However, changes in the environment require that species be able to adapt (change) to survive.

5. **Relationship of Structure to Function** – The shape, size, and other physical attributes of a structure determine how it will work (function). At each level of biological organization, structures are determined by their function.

6. **Regulation** – Biological systems (cells, organisms, ecosystems) are dynamic and must be controlled by a complex form of regulation using positive and negative feedback mechanisms.

7. **Interdependence in Nature** – Nature is a complex system that requires organisms to interact with one another.

8. **Science, Technology, and Society** – Scientific and technological advances are made possible by scientists that conduct research. Society must determine the possible positive and negative impacts specific types of advances will create and regulate the advances to ensure human safety.

Course Topics and Percentage Goals

I. Molecules and Cells (25%)

A. Chemistry of Life: Chps 1- 5

1. Water
2. Organic molecules in organisms
3. Free energy changes
4. Enzymes

B. Cells: Chps 6, 7, 12

1. Prokaryotic and eukaryotic cells
2. Membranes
3. Subcellular organization
4. Cell cycle and its regulation

C. Cellular Energetics: Chps 8-10

1. Coupled reactions
2. Fermentation and cellular respiration
3. Photosynthesis

II. Heredity and Evolution (25%)

A. Heredity: Chps 13-15

1. Meiosis and gametogenesis
2. Eukaryotic chromosomes
3. Inheritance patterns

B. Molecular Genetics: Chps 16-21

1. RNA and DNA structure and function
2. Gene regulation
3. Mutation
4. Viral structure and replication
5. Nucleic acid technology and applications

C. Evolutionary Biology: Chps 22-25

1. Early evolution of life
2. Evidence for evolution
3. Mechanisms of evolution

III. Organisms and Populations (50%)

A. Diversity of Organisms: Chps 26-32

1. Evolutionary patterns
2. Survey of the diversity of life
3. Phylogenetic classification
4. Evolutionary relationships

B. Structure and Function of Plants and Animals: Chps 35-51

1. Reproduction, growth, and development
2. Structural, physiological, and behavioral adaptations

3. Response to the environment

C. Ecology: Chps 52-56

1. Population dynamics
2. Communities and ecosystems
3. Global issues

AP LAB TOPICS (The Dirty Dozen)

1. Diffusion and Osmosis
2. Enzyme Catalysis
3. Mitosis and Meiosis
4. Plant Pigments and Photosynthesis
5. Cell Respiration
6. Molecular Biology
7. Genetics of Organisms
8. Population Genetics and Evolution
9. Transpiration
10. Physiology of the Circulatory System
11. Animal Behavior
12. Dissolved Oxygen and Aquatic Primary Productivity

Laboratory Work

All of the above required twelve AP Biology Labs are utilized, in addition to teacher-generated labs. Whenever possible and appropriate, open-ended student designed inquiry labs are used. Students determine their own questions to investigate, decide what type of data is necessary to collect and what protocols will do so, conduct lab, collect and analyze their data and then determine what conclusions may or may not be drawn. **The laboratory experiments are mandatory and must be completed after school or at lunch on Wednesdays if a student is absent. The labs may not be completed until the lab safety agreement has been signed and returned to the teacher.**

Laboratory Reports

Students will complete a laboratory report for each experiment in a bound composition lab notebook. Lab reports will follow a specific format given in class. NO SPIRAL NOTEBOOKS. **There will be no credit for lab write-ups until they are in a bound notebook.** Notebooking format will be given in class.

Grading

Students can expect a quiz or major test every two to three weeks. These tests will cover multiple chapters and each exam will have both multiple choice and essay questions taken from old AP Biology exams.

94-100 = A	77-79= C+	**50% Tests and quizzes**
90-93 = A-	74-76 = C	**50 % Labs and homework**
87-89 = B+	70-73 = C-	
84-86= B	67-69 = D+	
80-83 = B-	60-66 = D	

Late Work

Assignments are due at the beginning of the period. Late work will be reduced by 50% for every day it's late.

Cheating

Cheating will not be tolerated. I expect that when working in groups parts of your lab reports will be the same in each group. But conclusions of your labs and any written essays

or reports must be original. The effort you put into copying can be put into actually learning the material. Scores will be divided by how many people do the same work. Parents will be called on the second offense.

Behavior

Immature behavior will absolutely not be tolerated. All school handbook policies will be enforced. Please do not waste our time or embarrass yourself with immature behavior in an AP class. You will also be taking practice tests from old AP exams throughout the year. You may be tempted to surf the net for the answers. There is no way for me to regulate this but hope you understand that cheating on these is wasted effort and only hurting your chances of passing the AP exam in May.

Extra Help

I am here 30 minutes before and at least 30 minutes after school each day. Please feel free to let me know if you need extra help and I will make arrangements to come in earlier or stay later. I usually check my email at night so you can ask me any last minute questions or are in a panic about the material. It is also a great idea to form study groups three or four friends and meet regularly at least one morning, afternoon, or evening per week to discuss the current subjects.

~Mrs. O'Malley
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Schedule

*Root word tests will be interspersed throughout the year. Free Response Questions will be practiced with every unit.

Unit 1: The Chemistry of Life

Introduction, The Chemical Context of Life, Water, Carbon and the Molecular Diversity of Life, The Structure and Function of Large Biological Molecules.
Readings: Chps 1, 2, 3, 4, 5
Labs: Scientific Method Worm Lab, Lab Notebooking, and Biomolecule identification lab.
Vocabulary quizzes: chapters 1-3, 4-45.
Test: Chps 1-3, 4,5.

Unit 2: The Cell

A. Cell Structure and Membrane Function
Readings: Chps 6, 7,
Labs: **AP Lab 1: Osmosis and Diffusion**, Student model of cell membrane.
Vocabulary quizzes: chapters 6 and 7.
Test: Chapters 6 and 7 .

B. Cell metabolism, Respiration, Photosynthesis
Readings: Chps 8, 9, 10
Labs: **AP Lab 2: Enzyme Catalysis, AP Lab 5: Cell Respiration Lab, AP Lab 4: Plant Pigments and Photosynthesis**
Vocabulary quizzes: Chapters 8-10.
Test: Chps 8, 9, 10.

C. Cell Signaling and The Cell Cycle
Readings: Chapters 11 and 12.
Labs: AP Lab 3 Meiosis

Vocabulary quizzes: chapters 11 and 12.
Test: chapters 11 and 12.

Unit 3: Genetics

A. Meiosis and the Sexual Life Cycles, Mendel and the Gene Idea, The Chromosomal Basis of Inheritance.
Readings: Chps 13, 14, 15
Labs: **AP Lab 3: Mitosis and Meiosis, AP Lab 7: Genetics of Organisms Lab, AP Lab 11: Animal Behavior.**
Test: Chps 13, 14, 15.

Christmas Break: Dec. 22nd- Jan 5th
Independent Study:
Unit 8: Ecology
Readings: chapters 52-56.
Lab upon return: AP Lab 12: Dissolved Oxygen and Aquatic Primary Productivity.
Test: 52-56

B. The Molecular Basis of Inheritance, From Gene to Protein, Regulation of Gene Expression.
Readings: Chps 16-18.
Labs: DNA Extraction Lab, DNA Jewelry, Protein Synthesis Lab.
Test: Chps. 16-18.
Comprehensive Midterm: January 22nd, 2009.

C. Viruses, Biotechnology, Genomes and Their Evolution
Readings: Chps 19, 20, 21
Labs: **AP Lab 6: Molecular Biology**
Test: Chps 19-21.

Unit 4: Mechanisms of Evolution
Descent with Modification: A Darwinian View of Life, The Evolution of Populations, The Origin of Species, The History of Life on Earth.
Readings: chps 22-25
Labs: **AP Lab 8: Population Genetics and Evolution**
Test: chps 22-25.

Unit 5: The Evolutionary History of Biological Diversity
A. Phylogeny and the Tree of Life, Bacteria and Archaea, Protists
Readings: chps 26-28
Test: chps 26-28.

B. Plant Diversity I. How Plants Colonized Land, Plant Diversity II: The Evolution of Seed Plants, Fungi, An Introduction to Animal Diversity, Invertebrates, Vertebrates.
Readings: chps 29-34.
Test: chps 29-32:.

Unit 6: Plant Form and Function
Readings: chps 35-39
Lab: AP Lab 9: Transpiration
Test: chps 35-39.

Unit7: Animal Form and Function
Readings: chps 40-51, some independent study.

Lab: **AP Lab 10: Physiology of the Circulatory System**
Field Trip to Zoo for animal behavior study.
Review for AP Exam: May 4th-8th.

Science Project: Each student will complete an independent research project using the scientific method using one of the topics studied in class. Projects will be presented after the AP Exam.
Field Trips: Amgen Corporation; "Lucy" Exhibit, Pacific Science Center; NOAH.

AP BIOLOGY EXAM DATE: MAY 11, 2009, 8:00 A.M.

Return portion below to Mrs. O'Malley

STUDENT: I, _____ have read and understand the course syllabus.

Signed: _____ Date: _____

PARENT: I, _____ have read and understand the course syllabus.

Signed: _____ Date: _____

Parent/Guardian email: _____

Parent/Guardian phone #: _____