

SYLLABUS

Teacher	Mrs. Marianna Lee
E-mail	mlee@ferrahian.com
Conference Hours	TBD
Course Name & Grade Level	9 th Grade Biology
Textbooks	‘Biology’ By: Miller and Levine Foundation Edition 2014 ISBN-13: 978-0-13-323638-5
Resources	Online
Required Materials	Pencils, pen, erasers, colored correcting pen, and composition notebook, Lab notebook

Course Description:

The Biology course is a survey class that incorporates new perspectives and understandings across major sub-disciplines of biology including but not restricted to cytology, biochemistry, genetics, taxonomy, ecology, botany, anatomy, and physiology. The concept of evolution is seen as a central organizing theme in biology with emphasis being placed on the various comparisons among organisms. Furthermore, the course contains a laboratory component that promotes understanding through exploration. Students will be exposed to various biotechnological techniques and advancements that will enhance their understanding of applicable concepts and serve as a building block for future courses. Biology prepares students for college and advanced placement courses in addition to sensitizing students to the various moral and environmental issues that affect our times.

- Each lesson has content standard(s) and the school-wide adopted ESLR’s listed at the beginning of the lesson.
- All the 9th grade California Science Standards will be covered this year. This class integrates many aspects of science including an emphasis that is placed on the understanding and use of the scientific method. Students will learn by thinking, talking, and writing about what they do and discover in science. This year students will be focusing on life science. This includes cell biology, genetics, evolution, structure and function of living systems, and, of course, investigation and experimentation throughout these concepts.
- In my estimation, the purpose of a biology course is to encourage students to inquire about the environment they reside in and understand how all biological systems are interconnected. Furthermore, I intend for my students to attain a strong understanding of the main themes and concepts of biology and recognize how these concepts relate to themselves and their environment. Students enhance their critical thinking skills as they gather, evaluate, and synthesize information for a variety of sources. For this reason, my goal is incorporate different sources of information and learning techniques in my lessons. Additionally, students of Biology need to effectively and responsibly use technology to enhance their problem solving skills. These goals are achieved not only through the use of the textbook but also through the laboratory component of the course and the research assignments completed throughout the academic year. Specifically, students are required to submit several papers over the course of the year, based on research from published scientific works found in newspaper articles and scientific journals.

ESLRs Addressed

1a 1b 1c

2a 2b 2c

3a 3b 3c

4a 4b 4c

5a 5b 5c

Re-enter in the following boxes the designated ESLRs numbers, which are addressed by this course

1 a, b, and c

3 a, b, and c

4 a, b, and c

5 a, b, and c

Content Standards

The following is the California Department of Education Content Standards of this Course.

Focus on Life Science

A. Cell Biology

1. The fundamental life processes of plants and animals depend on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:
 - a. Students know cells are enclosed within semi permeable membranes that regulate their interaction with their surroundings.
 - b. Students know enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the temperature, ionic conditions, and the pH of the surroundings.
 - c. Students know how prokaryotic cells, eukaryotic cells (including those from plants and animals), and viruses differ in complexity and general structure.
 - d. Students know the central dogma of molecular biology outlines the flow of information from transcription of ribonucleic acid (RNA) in the nucleus to translation of proteins on ribosomes in the cytoplasm.
 - e. Students know the role of the endoplasmic reticulum and Golgi apparatus in the secretion of proteins.
 - f. Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide.
 - g. Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide.
 - h. Students know most macromolecules (polysaccharides, nucleic acids, proteins, lipids) in cells and organisms are synthesized from a small collection of simple precursors.
 - i. * Students know how chemiosmotic gradients in the mitochondria and chloroplast store energy for ATP production.
 - j. * Students know how eukaryotic cells are given shape and internal organization by a cytoskeleton or cell wall or both.

B. Genetics

2. Mutation and sexual reproduction lead to genetic variation in a population. As a basis for understanding this concept:
 - a. Students know meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type.
 - b. Students know only certain cells in a multi cellular organism undergo meiosis.
 - c. Students know how random chromosome segregation explains the probability that a particular allele will be in a gamete.
 - d. Students know new combinations of alleles may be generated in a zygote through the fusion of male and female gametes (fertilization).
 - e. Students know why approximately half of an individual's DNA sequence comes from each parent.
 - f. Students know the role of chromosomes in determining an individual's sex.
 - g. Students know how to predict possible combinations of alleles in a zygote from the genetic makeup of the parents.

3. A multi cellular organism develops from a single zygote, and its phenotype depends on its genotype, which is established at fertilization. As a basis for understanding this concept:
 - a. Students know how to predict the probable outcome of phenotypes in a genetic cross from the genotypes of the parents and mode of inheritance (autosomal or X-linked, dominant or recessive).
 - b. Students know the genetic basis for Mendel's laws of segregation and independent assortment.
 - c. * Students know how to predict the probable mode of inheritance from a pedigree diagram showing phenotypes.
 - d. * Students know how to use data on frequency of recombination at meiosis to estimate genetic distances between loci and to interpret genetic maps of chromosomes.

4. Genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism. As a basis for understanding this concept:
 - a. Students know the general pathway by which ribosomes synthesize proteins, using tRNAs to translate genetic information in mRNA.
 - b. Students know how to apply the genetic coding rules to predict the sequence of amino acids from a sequence of codons in RNA.
 - c. Students know how mutations in the DNA sequence of a gene may or may not affect the expression of the gene or the sequence of amino acids in an encoded protein.
 - d. Students know specialization of cells in multi cellular organisms is usually due to different patterns of gene expression rather than to differences of the genes themselves.
 - e. Students know proteins can differ from one another in the number and sequence of amino acids.
 - f. * Students know why proteins having different amino acid sequences typically have different shapes and chemical properties.

5. The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:
 - a. Students know the general structures and functions of DNA, RNA, and protein.
 - b. Students know how to apply base-pairing rules to explain precise copying of DNA during semi conservative replication and transcription of information from DNA into mRNA.
 - c. Students know how genetic engineering (biotechnology) is used to produce novel biomedical and agricultural products.
 - d. * Students know how basic DNA technology (restriction digestion by endonucleases, gel electrophoresis, ligation, and transformation) is used to construct recombinant DNA molecules.
 - e. * Students know how exogenous DNA can be inserted into bacterial cells to alter their genetic makeup and support expression of new protein products.

C. Ecology

6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:
 - a. Students know bio diversity is the sum total of different kinds of organisms and is affected by alterations of habitats.
 - b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.
 - c. Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death.
 - d. Students know how water, carbon, and nitrogen cycle between abiotic resources and organic

- matter in the ecosystem and how oxygen cycles through photosynthesis and respiration.
- e. Students know a vital part of an ecosystem is the stability of its producers and decomposers.
 - f. Students know at each link in a food web some energy is stored in newly made structures but much energy is dissipated into the environment as heat. This dissipation may be represented in an energy pyramid.
 - g. * Students know how to distinguish between the accommodation of an individual organism to its environment and the gradual adaptation of a lineage of organisms through genetic change.

D. Evolution

- 7. The frequency of an allele in a gene pool of a population depends on many factors and may be stable or unstable over time. As a basis for understanding this concept:
 - a. Students know why natural selection acts on the phenotype rather than the genotype of an organism.
 - b. Students know why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene pool.
 - c. Students know new mutations are constantly being generated in a gene pool.
 - d. Students know variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.
 - e. * Students know the conditions for Hardy-Weinberg equilibrium in a population and why these conditions are not likely to appear in nature.
 - f. * Students know how to solve the Hardy-Weinberg equation to predict the frequency of genotypes in a population, given the frequency of phenotypes.
- 8. Evolution is the result of genetic changes that occur in constantly changing environments. As a basis for understanding this concept:
 - a. Students know how natural selection determines the differential survival of groups of organisms.
 - b. Students know a great diversity of species increases the chance that at least some organisms survive major changes in the environment.
 - c. Students know the effects of genetic drift on the diversity of organisms in a population.
 - d. Students know reproductive or geographic isolation affects speciation.
 - e. Students know how to analyze fossil evidence with regard to biological diversity, episodic speciation, and mass extinction.
 - f. * Students know how to use comparative embryology, DNA or protein sequence comparisons, and other independent sources of data to create a branching diagram (cladogram) that shows probable evolutionary relationships.
 - g. * Students know how several independent molecular clocks, calibrated against each other and combined with evidence from the fossil record, can help to estimate how long ago various groups of organisms diverged evolutionarily from one another.

E. Physiology

- 9. As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment. As a basis for understanding this concept:
 - a. Students know how the complementary activity of major body systems provides cells with oxygen and nutrients and removes toxic waste products such as carbon dioxide.
 - b. Students know how the nervous system mediates communication between different parts of the body and the body's interactions with the environment.
 - c. Students know how feedback loops in the nervous and endocrine systems regulate conditions

- in the body.
- d. Students know the functions of the nervous system and the role of neurons in transmitting electrochemical impulses.
 - e. Students know the roles of sensory neurons, interneurons, and motor neurons in sensation, thought, and response.
 - f. * Students know the individual functions and sites of secretion of digestive enzymes (amylases, proteases, nucleases, lipases), stomach acid, and bile salts.
 - g. * Students know the homeostatic role of the kidneys in the removal of nitrogenous wastes and the role of the liver in blood detoxification and glucose balance.
 - h. * Students know the cellular and molecular basis of muscle contraction, including the roles of actin, myosin, Ca^{+2} , and ATP.
 - i. * Students know how hormones (including digestive, reproductive, osmoregulatory) provide internal feedback mechanisms for homeostasis at the cellular level and in whole organisms.
10. Organisms have a variety of mechanisms to combat disease. As a basis for understanding the human immune response:
- a. Students know the role of the skin in providing nonspecific defenses against infection.
 - b. Students know the role of antibodies in the body's response to infection.
 - c. Students know how vaccination protects an individual from infectious diseases.
 - d. Students know there are important differences between bacteria and viruses with respect to their requirements for growth and replication, the body's primary defenses against bacterial and viral infections, and effective treatments of these infections.
 - e. Students know why an individual with a compromised immune system (for example, a person with AIDS) may be unable to fight off and survive infections by microorganisms that are usually benign.
 - f. * Students know the roles of phagocytes, B-lymphocytes, and T-lymphocytes in the immune system.

Class Schedule - Quarter 1

The schedule includes the textbook chapters to be covered throughout the year, additional subject matter, all lectures, tests, quizzes, projects and other relevant information.

First Semi-Quarter	
Week 1	Unit 1: The Nature of Life Chapter 1: The Science of Biology, Lessons: 1 through 3
Week 2	Unit 1: The Nature of Life Chapter 2: The Chemistry of Life, Lessons: 1 through 4 Chapter 1 Quiz
Week 3	Chapter 2: The Chemistry of Life, Lessons: 1- 4 Chapter 1 and 2 Test
Week 4	Unit 2: Ecology Chapter 3: The Biosphere, Lesson: 1-4 Quiz Chapter 3
Week 5	Unit 2: Ecology Chapter 3: The Biosphere, Lesson: 1-4 Chapter 3 Test

Second Semi-Quarter	
Week 1	Unit 2: Ecology

	Chapter 4: Ecosystems and Communities, Lesson: 1-5 Quiz Chapter 4
Week 2	Unit 2: Ecology Chapter 4: Ecosystems and Communities, Lesson: 1-5 Chapter 5: Populations, Lessons: 1-3 Chapter 4 Test
Week 3	Unit 2: Ecology Chapter 5: Populations, Lessons: 1-3 Chapter 5 Test
Week 4	Unit 3: Cells Chapter 7: Cell Structure and Function, Lessons: 1-4 Quiz Chapter 7
Week 5	Unit 3: Cells Chapter 7: Cell Structure and Function, Lessons: 1-4 Chapter 8: Photosynthesis, Lessons: 1-3 Chapter 7 Test

Class Schedule - Quarter 2

First Semi-Quarter	
Week 1	Unit 3: Cells Chapter 8: Photosynthesis, Lessons: 1-3 Quiz Chapter 8
Week 2	Unit 3: Cells Chapter 8: Photosynthesis, Lessons: 1-3 Chapter 9: Cellular Respiration and Fermentation, Lessons 1-3 Chapter 8 Test
Week 3	Unit 3: Cells Chapter 9: Cellular Respiration and Fermentation, Lessons 1-3 Chapter 9 Test
Week 4	Unit 3: Cells Chapter 10: Cell Growth and Division, Lessons 1 - 4 Quiz Chapter 10

Second Semi-Quarter	
Week 1	Unit 3: Cells Chapter 10: Cell Growth and Division, Lessons 1- 4 Chapter 10 Test
Week 2	Unit 4: Genetics Chapter 11: Introduction to Genetics, Lessons 1 - 4 Chapter 11 Quiz
Week 3	Unit 4: Genetics Chapter 12: DNA, Lessons 1-3 Chapter 11 Test

Week 4	Review for Midterms On Chapters 1-5 and Chapters 7-12
Week 5	*****MIDTERMS*****

Class Schedule - Quarter 3

First Semi-Quarter	
Week 1	Unit 4: Genetics Chapter 13: RNA and Protein Synthesis, Lessons 1-4 Quiz on Chapter 13
Week 2	Unit 4: Genetics Chapter 13: RNA and Protein Synthesis, Lessons 1-4 Test on Chapter 13
Week 3	Unit 4: Genetics Chapter 14: Human Heredity, Lessons 1-3 Quiz on Chapter 14
Week 4	Unit 4: Genetics Chapter 14: Human Heredity, Lessons 1-3 Chapter 15: Genetic Engineering, Lessons 1-4 Test on Chapter 14
Week 5	Unit 4: Genetics Chapter 15: Genetic Engineering, Lessons 1-4 Test on Chapter 15

Second Semi-Quarter	
Week 1	Unit 5: Evolution Chapter 16: Darwin's Theory of Evolution, Lessons 1 - 4 Quiz on Chapter 16
Week 2	Unit 5: Evolution Chapter 16: Darwin's Theory of Evolution, Lessons 1 – 4 Chapter 17: Evolution Populations, Lessons 1-4 Test on Chapter 16
Week 3	Unit 5: Evolution Chapter 17: Evolution of Populations, Lessons 1 - 4 Quiz on Chapter 17
Week 4	Unit 5: Evolution Chapter 17: Evolution of Populations, Lessons 1 – 4 Unit 7: Animals Chapter 25: Introduction to Animals, Sections 1-2 Test on Chapter 17

Week 5	Unit 7: Animals Chapter 25: Introduction to Animals, Sections 1-2 Test on Chapter 25
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Class Schedule - Quarter 4

First Semi-Quarter	
Week 1	Unit 7: Animals Chapter 26: Animal Evolution and Diversity, Sections 1-3 Quiz on Chapter 26
Week 2	Unit 7: Animals Chapter 26: Animal Evolution and Diversity, Sections 1-3 Chapter 27: Animal Systems I, Sections 1-4 Test on Chapter 26
Week 3	Unit 7: Animals Chapter 27: Animal Systems I, Sections 1-4 Chapter 28: Animal Systems II, Sections 1-4 Quiz on Chapter 27
Week 4	Unit 7: Animals Chapter 27: Animal Systems I, Sections 1-4 Chapter 28: Animal Systems II, Sections 1-4 Quiz on Chapter 28
Week 5	*****Easter Vacation*****
Week 6	Unit 7: Animals Chapter 29: Animal Behavior, Sections 1-2 Test on Chapter 27 and Chapter 28

Second Semi-Quarter	
Week 1	Unit 7: Animals Chapter 29: Animal Behavior, Sections 1-2 Test on Chapter 29
Week 2	Unit 6: From Microorganisms to Plants Chapter 20: Viruses and Prokaryotes, Sections 1-3 Quiz on Chapter 20
Week 3	Unit 6: From Microorganisms to Plants Chapter 20: Viruses and Prokaryotes, Sections 1-3 Chapter 22: Introduction to Plants, Section 1-4 Test on Chapter 20
Week 4	Unit 6: From Microorganisms to Plants Chapter 22: Introduction to Plants, Section 1-4
Week 5	****Review chapters covered (13-17, 20, 22, 25-29)****

Week 6	*****Finals***** Have a great summer! ☺
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Classroom Rules

This section includes the rules set by the teacher and the consequences of violating these rules.

Classroom Rules:

1. **Have all appropriate materials and supplies at your desk and be seated when the bell rings.**
2. **Respect the people, equipment, and furnishings in the classroom.**
3. **Follow the directions the first time they are given.**
4. **Raise your hands and wait for permission to speak.**
5. **Stay in your assigned seat unless you have permission to do otherwise.**

Consequences:

1. **Verbal warning**
2. **Meeting with student**
3. **'Action Plan'**
4. **Contacting parent(s)**

School Grading Policy

This section includes grading policies set by the school administration for grades 6-12

The grades assigned to students are based on their **academic progress**. Students receive **Academic** and **Cooperation** grades for every quarter of the four-quarter academic year. Students also receive a mid-term progress report for each of these 9-10 weeklong quarters. Besides the quarter grades, students are assigned semester grades for each class or course.

Grading:

- **Exams** **60%**
 - Tests 40%
 - Quizzes 20%

(1 lowest score for the quiz is dropped)
- **Homework** **10%**

(No late work)
- **Labs/ Research Projects** **20%**
- **Participation** **10%**

Academic Grade Scale - Grades 6-12															
Letter Grade	Scale	Scale	Scale	Letter Grade	Scale	Scale	Scale	Letter Grade	Scale	Scale	Scale	Letter Grade	Scale	Scale	Scale
	100	4	Wt.		100	4	Wt.		100	4	Wt.		100	4	Wt.
A+	100	4.4	5.4												
A+	99	4.3	5.3	B+	89	3.3	4.3	C+	79	2.3	3.3	D+	69	1.3	1.3
A+	98	4.2	5.2	B+	88	3.2	4.2	C+	78	2.2	3.2	D+	68	1.2	1.2
A+	97	4.1	5.1	B+	87	3.1	4.1	C+	77	2.1	3.1	D+	67	1.1	1.1
A	96	4.0	5.0	B	86	3.0	4.0	C	76	2.0	3.0	D	66	1.0	1.0
A	95	3.9	4.9	B	85	2.9	3.9	C	75	1.9	2.9	D	65	0.9	0.9
A	94	3.8	4.8	B	84	2.8	3.8	C	74	1.8	2.8	D	64	0.8	0.8
A	93	3.7	4.7	B	83	2.7	3.7	C	73	1.7	2.7	D	63	0.7	0.7
A-	92	3.6	4.6	B-	82	2.6	3.6	C-	72	1.6	2.6	D-	62	0.6	0.6
A-	91	3.5	4.5	B-	81	2.5	3.5	C-	71	1.5	2.5	D-	61	0.5	0.5
A-	90	3.4	4.4	B-	80	2.4	3.4	C-	70	1.4	2.4	D-	60	0.4	0.4
												F	0-59	0	0

Assessment

This section includes rules set by the school administration

Test/Quiz Policy

Students take **at least** TWO tests and two quizzes per class or course per semi-quarter. Two to four quizzes may be counted as one test. It is up to the individual teacher to adopt a policy to drop the lowest test grade of a student in calculating the quarter grade. No more than two tests are scheduled on the same day. The test scheduled last will be automatically dropped.

Test/Quiz Make-Up

Students with **excused** absences shall have the opportunity to complete missed class work and make up all tests receiving full credit. The student is responsible to arrange for the make-up.

Students who miss a test/quiz because of an **unexcused** absence will receive a failing grade on that test/quiz, except when the teacher decides to offer the chance for make-up.

If a student misses a test/quiz while on suspension, he/she will not have the opportunity to make up the test/quiz and will receive an "F".

Cheating

Acts of cheating or plagiarism will result in suspension and the student will receive an "F" (20/100) on the test or the assigned work.

This section includes grade percent distribution and additional rules set by the teacher

Tests:

There will be a test upon the completion of each chapter. Exams will typically consist of multiple choice, matching, true and false questions, and short answer responses

*Test make-up policy: Students with an excused absence can take the missed test within 1 to 2 days of returning to school. It is the student's responsibility to meet with the teacher to set the date when the make-up test will be given.

Quizzes:

Quizzes will typically be given on a weekly basis. Students will know about the quiz in advance. There will not be any graded pop quizzes.

Laboratory Assignments:

Labs and collaborative group activities will occur to reinforce any concepts or topics covered in a chapter. Lab write-ups will be due **one week** from the time the laboratory activity. Laboratory investigations should always be done in accordance to teacher directions and the laboratory code of conduct (i.e., the science safety contract).

Projects:

Expectations and guidelines will be provided and explained in class.

Homework:

Homework is assigned Monday through Friday. Students are required to read the appropriate chapters and sections, as well as answer any follow-up questions or activities. Late homework will NOT be accepted (except for in case of excused absences)*. Two missed homework assignments will result in parent notification.

*using "ATP's" is allows homework assignments to be turned in up to one week late for full credit. Any homework turned in after one week, will not receive full points.

Participation:

Students should come to class prepared and ready to learn. Books, folders, notebooks, writing materials, and other necessary items should be brought to class unless noted otherwise.

*Extra credit assignments may be given occasionally during the school year. However, students should not depend on these assignments to ensure a desirable grade in the class.