AP Biology Syllabus

2015-2016



**AP BIOLOGY 491/492**

**Course Description**

The AP Biology course is designed to be the equivalent of an introductory biology course usually taken by biology majors during their first year of college. By building the course around, and making connections between the four Big Ideas, students are provided a conceptual framework, factual knowledge, analytical and inquiry skills necessary to think critically and to deal with the rapidly changing science of biology. The investigative lab component of the course is designed around seven science practices that engage learners in inquiry-based activities, which lead to critical thinking for environmental and social concerns.

The college course in biology differs significantly from the usual first high school course in biology with respect to the kind of textbook used, the range and depth of topics covered, the type of laboratory work done by students, and the time and effort required by students. The textbooks used for AP Biology, as well as the labs performed, should be the equivalent of those done by college students.

**Instructional Recommendations**

Students who are Juniors and/or Seniors must have successfully completed one year of biology and one year of chemistry before enrolling in AP Biology.

**Instructional Resources/Textbooks**

2-3” binder with 5 dividers Blue/Black ink pens

Index cards (and something to store them in) #2 pencils

Post-It Notes Highlighters

Ample supply of loose-leaf paper Lab notebook

Campbell, Neil and Reece, Jane B. 2008. AP Edition Biology, Eighth Edition, San

Francisco, CA: Pearson Benjamin Cummings

Campbell, Neil. Student AP Edition Biology Student Study Guide, Eighth Edition (ISBN 0-8053-7155-9)

AP Biology Investigative Labs: An Inquiry-Based Approach, The College Board,

2012

Summer Blog Assignment: Survival of the Sickest. Maolem, Sharone

**Course Content**

The content of AP Biology is built around four Big Ideas, which encompass the core scientific principles, theories and processes governing living organisms and biological systems. For each Big Idea, there is an Enduring Understanding, which incorporates the core concepts that students should retain from the learning experience, as well as essential knowledge associated with the enduring understandings.

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| **Four Big Ideas** | **Essential Understandings** |
| **#1****The process of evolution drives the diversity and unity of life.** | **A. Change in the genetic makeup of a population over time is****evolution.****B. Organisms are linked by lines of descent from common****ancestry.****C. Life continues to evolve within a changing environment.****D. The origin of living systems is explained by natural processes.** |
| **#2****Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.** | **A. Growth, reproduction, and maintenance of the organization of living systems require free energy and matter.****B. Growth, reproduction, and dynamic homeostasis require that****cells create and maintain internal environments that are different****from their external environments.****C. Organisms use feedback mechanisms to regulate growth and reproduction, and to maintain dynamic homeostasis.****D. Growth and dynamic homeostasis of a biological system are influenced by changes in the systemʼs environment.****E. Many biological processes involved in growth, reproduction, and dynamic homeostasis include temporal regulation and****coordination.** |
| **#3****Living systems store, retrieve, transmit, and respond to information essential to life processes.** | **A. Heritable information provides for continuity of life.****B. Expression of genetic information involves cellular and****molecular mechanisms.****C. The processing of genetic information is imperfect and is a****source of genetic variation.****D. Cells communicate by generating, transmitting, and receiving chemical signals.****E. Transmission of information results in changes within and****between biological systems.** |
| **#4****Biological systems interact, and these systems and their interactions possess complex properties.** | **A. Interactions within biological systems lead to complex****properties.****B. Competition and cooperation are important aspects of biological****systems.****C. Naturally occurring diversity among and between components****within biological systems affects interactions with the****environment.** |

**Lab Investigations**

In addition to the Big Ideas, enduring understandings, and essential knowledge, the AP Biology course is also built around inquiry-based lab investigations and seven science practices that are used throughout the course. Through inquiry, questions will be answered by students using a variety of methods, such as field investigations, use of computer programs, and data sets. Students will make observations, ask questions, and design models of experiments. They will also use mathematical analysis in data collection and communicate results.

One day out of every four (25% of instructional time) is devoted to lab work. Students are required to come to lab prepared. Students will participate in a minimum of eight inquiry investigations (two per Big Idea). Additional labs and hands-on activities will be performed that will reinforce the science practices.

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| **Seven Science Practices** |
| **#1** | **The student can use representations and models to communicate scientific phenomena and solve scientific problems.** |
| **#2** | **The student can use mathematics appropriately.** |
| **#3** | **The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.** |
| **#4** | **The student can plan and implement data collection strategies appropriate to a particular scientific question.** |
| **#5** | **The student can perform data analysis and evaluation of evidence.** |
| **#6** | **The student can work with scientific explanations and theories.** |
| **#7** | **The student is able to connect, and relate knowledge across various scales, concepts and representations in and across domains.** |

During the course, students will complete the recommended laboratories in the *AP Biology Investigative Labs: AnInquiry-Based Approach.* The topics covered in these labs are:

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| **Investigation 1** | **Artificial Selection** | **Big Idea 1****SP 2, 5, 7** |
| **Investigation 2** | **Mathematical Modeling: Hardy-Weinberg** | **Big Idea 1****SP 1, 2, 5** |
| **Investigation 3** | **Comparing DNA Sequences to Understand Evolutionary Relationships with BLAST** | **Big Idea 1****SP 1, 2, 5** |
| **Investigation 4** | **Diffusion and Osmosis** | **Big Idea 2****SP 2, 4, 5** |
| **Investigation 5** | **Photosynthesis** | **Big Idea 2****SP 1, 2, 3, 6, 7** |
| **Investigation 6** | **Cellular Respiration** | **Big Idea 2****SP 1, 2, 3, 6, 7** |
| **Investigation 7** | **Cell Division:** **Mitosis and Meiosis** | **Big Idea 3****SP 1, 5, 6, 7** |
| **Investigation 8** | **Biotechnology:** **Bacterial Transformation** | **Big Idea 3****SP 1, 3, 5, 6, 7** |
| **Investigation 9** | **Biotechnology:** **Restriction Enzyme Analysis** | **Big Idea 3****SP 3, 6** |
| **Investigation 10** | **Energy Dynamics** | **Big Idea 4****SP 1-7** |
| **Investigation 11** | **Transpiration** | **Big Idea 4****SP 1,2, 4, 6, 7** |
| **Investigation 12** | **Fruit Fly Behavior** | **Big Idea 4****SP 1, 3, 4, 5, 6, 7** |
| **Investigation 13** | **Enzyme Activity** | **Big Idea 4****SP 4, 5, 6, 7** |

**Classroom Rules and Procedures**

**ABSENCES**: You are responsible for getting your assignments when you are absent. **If you missed an announced test, you will take it the day you return**. All other assignments must be completed within 5 days of returning to school.

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| **CLASS RULES**1. Always follow instructions.2. Stay in your seat until permitted to move.3. Wait until you are called on to speak.4. Treat everyone with respect.1. Follow all lab safety rules.
 | **CONSEQUENCES**First violation - WarningSecond violation - After school detention/call parentsThird violation - Office referral |

Severe misbehavior/disrespect will result in an immediate office referral.**The school’s tardy policy will be enforced.**

**Grading System**

Individual grades are assigned with the following weights for each category:

Tests (Cover notes, labs, handouts, and textbook assignments) 55%Lab Report 25%

Quizzes 10%

Misc. (Class work, homework, etc) 10%

**FORMAL LAB REPORTS**: All lab reports/data sheets are due exactly **one week** from the date of completion of lab. All pre-lab exercises must be turned in **prior to doing the lab**. Extended lab time is required for all students and lab dates are given well in advance so arrangements can be made. All graded formal lab reports will be kept by the teacher.

**FREE-RESPONSE QUESTIONS**: Each topic will have a free response question appropriate for that chapter or a previous chapter. Each exam will include one free-response question

**READING**: Students are expected to read each chapter thoroughly prior to material being covered in class. Test items may come directly from the reading. **Not all information in each chapter will be discussed in class.** Refer to the portal calendar for upcoming chapters, tests, assignments, etc.

**SEMESTER/PRACTICE EXAM**: This course includes a cumulative exam at the end of the semester. Information about exam exemption is available in the student handbook. A practice exam will be given during 2nd semester and will count as your final exam. All students must take this exam.

**MAKE-UPS**: Test make-ups will be after school or during Panther Period. Most lab make-ups will have to be completed after school the following day, because many of the materials used are perishable. Online simulation labs may be used as a substitute for physical labs. Absences due to school events are **not regular absences**; therefore, any work due on the day of your absence for a school event should be turned in **on or before** the deadline.

**LATE WORK**: You must turn in your assignment at the **BEGINNING** of the class period. If you turn it in after the assignment has been collected or after the class period on the same day, the work is late. One day late = -25 points. Two days late = -50 points. More than two days late = ZERO!!!!!

**REVIEW NIGHTS**: Review nights are offered beginning in March. We will meet every Thursday night. Attendance is not required but is highly recommended. We will review old AP exams and material that will be tested on the AP Exam. Attendance at ALL review sessions will earn the student an extra 100 test grade.

**TUTORING**: I will be available for extra help as needed before and after school. I can be available at 7:00 am. I usually stay until 4:00 in the afternoon. Please let me know in advance if you will be coming for tutoring. Please come see me if you encounter a problem. Don’t wait until the end of the semester to get help.

**ACADEMIC INTEGRITY**: Cheating on assignments, quizzes, and tests will not be tolerated in this class. If a student is caught cheating, a zero will be entered as the grade for the assignment and disciplinary action will be taken. If caught cheating, the student has violated a sacred trust and therefore earned a loss of credibility and respect from the teacher. Although all definitions of cheating cannot be covered in this syllabus, the following situations are a few examples:

* + Copying homework from another student
	+ Writing on the desk or on your person or creating any other sort of cheat sheet.
	+ Using a cell phone or other electronic device at any time during a quiz or exam
	+ Plagiarism
	+ Looking at another student’s paper or getting help from another student during a quiz or exam
	+ Discussing contents of a test or quiz with other classes before/after they have taken it.
	+ Using notes, quizzes, exam, projects, and labs reports from other students (**both current or past**).
	+ Changing answers on a test after you have seen the tests other students have turned in.
	+ Use of the teacher’s edition or test bank for the textbook currently in use.

The AP Biology Exam will be given on Monday, May 9th at 8:00 am! ☺

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STUDY!!!

**Honor Statement**

I, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, pledge that any assignment submitted for a grade will reflect my own words and thoughts. I will, in no way, copy another person’s work or ideas and present them as my own. I understand that if I break this pledge, I will be subject to any disciplinary action that is deemed necessary by the administration of this school and Mrs. Conner.

Student signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_

Parent signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_

**Syllabus Acknowledgment**

I have read and understand all of the objectives, requirements, rules, and expectations for AP Biology.

Student signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_

Parent signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_

What is the best time of day to contact you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the best method of contact?

 Home Phone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Cell Phone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Email \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Is the student allergic to:

Peanuts (of any variety or form) Yes No

Latex Yes No

List **any** other allergies that may prohibit student from lab activities: