

AP Biology Syllabus 2017-2018

Julie Paoli

japoli@seq.org

<http://www.carlontapbio.com>

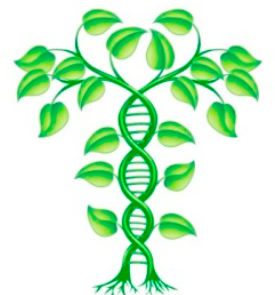
Introduction:

This is an AP course, not an honors course. You may possibly receive college credit for this class. Therefore, you should expect this class to run at a college pace. Be prepared to do homework every night, whether it is textbook reading, studying for exams, preparing for projects, or completing other homework handed out in class. You and your parents should not be surprised by course requirements that are in excess of what you would expect from an honors level course. AP Biology covers two FULL semesters of college Biology which is more than many other AP courses. It is not unusual for you to be responsible for several assignments at the same time. Time management is one key to success. **Check the calendar and plan your time each week.** Also, if you are accustomed to making all A's, you may make B's or C's on tests and may start to doubt yourself, your teacher, and your decision to enter the course. I will do my best to support you. I provide many opportunities for learning the content. Even if you are not able to make all A's on the exams you can still do well in this course.

The goal of the class is to enrich your understanding and appreciation of biology as well as to pass the AP Biology exam in May at the end of the school year. *Taking the exam is highly recommended, you have nothing to lose by taking the exam.* You will need to complete a large amount of independent studying as I do not have enough class time to cover every topic in the depth necessary for the AP exam. I expect that you come to school every day prepared to work and go home every night prepared to study. *We will work hard in class but you will also need to be self-motivated as we can not cover all the topics on the AP exam.* As your teacher, I am merely a guide to help you reach that goal.

The AP Biology Curriculum: AP Biology was redesigned in 2013 and the new curriculum focuses on helping students understand biological concepts on a deeper level and make connections across all levels of the course content. The course is designed around four big ideas and seven science practices. The College Board wants the students to become active scientist by developing and conducting inquiry based labs. For many students this will be a new approach to science and it may take a while for them to become comfortable with science as a process rather than science as specific knowledge. Inquiry labs can feel messy and disorganized as students do not always know what to expect. Please understand that if its feeling hard you are probably learning a great deal from your experiences.

I really enjoy teaching this content, but it is the student's responsibility to put in the learning time to fully understand the concepts and make connections. There are so many examples of concepts we will be studying. We will take some time to look at current research and apply it to what we are learning. This is a dynamic course and you are strongly encouraged to participate to get the most out of it. A positive attitude will go a long way toward success.



Textbook/ Instructional Materials:

The textbook we are going to use is *AP Edition Campbell Biology (9th edition)*, by Reece, Urry, Cain, et. all. You may purchase your textbook instead of borrowing one from Carlmont's library. This is useful for many reasons. First, you have the opportunity to take a textbook with you to college that you have fully read and understood. Second, you may highlight the text while you are reading as well as take notes in the margin of your textbook. This is a helpful tool for reading comprehension, reviewing important highlighted material for the AP exam, and taking notes during class that relate to the textbook. The text ISBN number is #0131375040 and costs roughly \$40-\$120. You may look for the textbook online at sites like www.amazon.com, www.varsitybooks.com, directtextbook.com, or www.ecampus.com.

Materials:

You will be expected to have the following everyday IN CLASS:

1. **Graph Paper Composition Lab Notebook** – To keep all lab data and analysis. Labs notebook copies will be turned in for a lab NB grade
2. **Two spiral bound notebooks (One per semester)** – This will serve as your interactive science notebook (see the handout explaining how to set up the notebook with title page, table of contents, differences between input and output pages, reflection page at the end of each unit, etc.). Get the largest one you can find, even if multiple subject. Must be at least over 150 pages.
3. **Pencils** – No. 2 lead and **colored**.
4. **Pens** – **2 to 3 colors** for taking notes.
5. **Glue sticks** – Needed to glue in handouts.
6. **Scissors** – Recommended so you do not have to wait to cut things out.
7. **Review Guide** (optional but recommended) – Pearson or REA
8. **BioZone** (optional – but recommended)

The AP Exam:

The Advanced Placement Biology Examination is offered in May and is designed to allow high school students to pursue college-level studies. The exam is centered around four Big Ideas and seven Science Practices.

Big Ideas:

1. The process of evolution drives the diversity of life.
2. Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis.
3. Living systems store, retrieve, transmit and respond to information essential to life processes.
4. Biological systems interact, and these systems and their interactions possess complex properties.

Science Practices (SP)

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.

Structural Makeup of the Exam:

Section I – Multiple Choice (50% of the exam grade): 63 M/C questions, 6 grid-in questions = 90 Minutes

Section II – Free Response (50% of the exam grade): 6 short-response questions and 2 long-response questions = Reading Period = 10 Minutes; Writing Period = 90 Minutes

SECTION I			
Question Type	Number of Questions	Recommended Time Per Question	Total Time
Part A: Multiple Choice	63	1 Minute	90 Minutes
Part B: Grid-In	6	4 Minutes	

SECTION II			
Question Type	Number of Questions	Recommended Time Per Question	Total Time
Long Free Response	2	20 Minutes	80 Minutes + 10 Minute reading period
Short Free Response	6	6 Minutes	

The grade you receive on the AP Biology exam can be used by the college of your choice for placement in their biology program. Usually, colleges participating in the Advanced Placement Program recognize grades of 3 or better. You will need to check your individual school for requirements.

Recommended Participation Requirements for the Course:

The following events are part of the course, there will be alternative assignments, if you cannot make one of the following for any reason please let me know.

1. Practice AP Biology test given on a Saturday in April. Please reserve this date now. The test is a 3-hour test and will be given sometime between 8:00am and 5:00pm depending on school availability. Most likely April 14 or 22nd. I will poll students for conflicts and pick a date by Early November
2. The AP Biology exam given by the College Board. This test is taken in May. If you feel you do not want to take this exam please come speak with me. You gain a lot by passing it and part of your grade will be review for the exam.
3. Present at open house – this can be your yearly project or one of our labs or activities. Open House is usually during April on a Thursday night.
4. Complete a year long project – see the yearly project handout for instructions.

Attendance:

Obviously, a student cannot learn if they are not in class. Excessive absences will affect your grade as well as your performance on the AP Biology Exam. The school policy will be followed on unexcused or excessive absences. **Tardies** are subject to 50% participation reduction for the day for each tardy.

Procedures and Expectations:

AP Biology is a college-level course and in keeping with that I will be expecting mature and self-reliant students. Anything that prevents teaching or learning is not permitted. You will be expected to be on time and prepared. This means that all handouts have been picked up and all assignments have been turned in **before the tardy bell rings**. You should not expect a reminder to turn in work on the date due. You should be in your assigned seat when the tardy bell rings to be on time. You will adhere to a strict honor code. Students who share work will both earn a zero for the assignment/test. Serious cheating will result in removal from the course. **Cheating will not be permitted – We will follow the Carlmont Academic Integrity policy in the student planner.**

Due Dates:

Turn in dates will be stressed in this course and the homework board will be posted on a permanent basis in our classroom for you to consult. To be on time, an assignment must be turned in **before the tardy bell rings**. If it is turned in on the correct day, but after the start of your class period, 25% will be taken off after grading. Anytime after that, 50% of the grade will be subtracted after grading. You may only turn in late work up until the unit exam it relates to.

If you are not going to be here when an assignment is due, you have two options. Turn it in before the due date or have someone else turn it in before the tardy bell or before school on the due date. If you are attending a field trip, athletic event, or any school sanctioned event, the work must be submitted ahead of time.

If you have been absent it is your responsibility to check the make-up box for the work you have missed or to contact me either through email. Due dates are still enforced.

Assessment:

Points will be given for all assignments. Grades are given on the standard:

100-90% = A

89-80% = B

79-70% = C

69-60% = D

59% or lower = F

***Grades are NOT rounded up**

NOTE: Grades are not given on passing status of the AP exam.

Points are weighted according to the category. Tests, quizzes and projects are worth 40% of the class, laboratory investigations are worth 30%, homework is worth 25%, and class participation is worth 5%

LABS:

Labs are performed on a regular basis, with activities and lecture supporting your learning. Because the labs are inquiry based and student driven, it may take a week or more to finish. There are 13 labs the Advanced Placement Program recommends AP Biology students complete over the school year as well as other important labs needed to enhance student learning of difficult concepts. Many of the labs can take longer than 50 minutes to complete, especially if you are not prepared. Others will be completed the following day. Therefore, students may be asked to come in for a few minutes during lunch or before school to collect data for some labs. If you do not finish a lab during class time because you were not prepared you will be responsible for coming in on your own time to finish the lab. **I will not write passes** to the next class on lab days so students need to pay attention to the clock and plan accordingly.

All labs are hands-on and performed by students, not completed as a demonstration by the teacher. Students will work in groups of two to four.

A formal lab write-up will be written for many of the AP Biology required labs. Because science is a process, it is important that students focus on writing proper 3-step hypotheses, keeping a good record of results, analyzing data, relating the data back to expected outcomes or the content we are learning, identifying potential errors and either validating or disqualifying one's hypothesis.

Tests and Quizzes:

Every week there may be a reading quiz or practice FRQ. There will also be a few questions pertaining to information from previous weeks interspersed among questions pertaining to new information. Quiz grades will be handed back to students once every student has taken the quiz.

Unit exams will be modeled after the AP exam and include multiple-choice, grid in, and free response questions.

If a student is absent for a quiz, test, or essay please keep in mind that scores will not be given to the rest of the class. Therefore, you must take the test, quiz, or essay upon returning to school.

Multiple-choice questions that were missed on reading quizzes and unit exams may be re-written for ½ of the test point back. In order to receive credit, the student must explain in detail why each letter (A, B, C, D and E) is correct or incorrect. Test corrections are due one week following the return of scores. Corrections will help students understand why they missed specific concepts and help improve test scores in the future.

Yearly Project: I am currently updating the yearly project. The assignment will be on the website and all details will be covered in the first week of school.

Availability Outside of Class:

My availability will change depending on my schedule, however I am always available on Tuesday and Thursday at lunch. Anytime a student needs to see me for a clarification or additional help, please feel free to contact me to set up an appointment. I encourage students to get as much help as they need to ensure success.

Course Plan for the Year: This plan is subject to change as we all learn the new curriculum. Units may be rearranged in order to maximize student learning

Unit	Topics Covered	Labs/Activities
Unit 1: An Introduction, Animal Behavior & Natural Selection	Animal Behavior -51 Darwinian view of life - 22 Basic Chemistry - 2 Water – 3 Carbon - 4 Carbon Compounds – 5 *Students are expected to review CH 1 on their own.	Plant Parade Pill Bug Behavior Lab Bird Beak Activity Animal Behavior Skits Darwin Cartoon Evolution Tri-Mind Origin of life timeline Macromolecule Lab – online Macromolecule Model Artificial Selection Lab (ongoing)
Unit 2: Cells, Membranes and Cell Transport	A Tour of the Cell – 6 Membrane Structure and Function – 7 Cell Cycle – 12 Transport in Plants – 36*	Inside the Cell Endocytosis in a baggie Cell Size inquiry lab Osmosis Inquiry lab Mitosis lab data analysis Stomata Lab Transpiration Inquiry Lab

Unit 3: Energy Dynamics	Introduction to Metabolism – 8 Photosynthesis – 10 Cell Respiration & Fermentation – 9 Ecosystems & Restoration Ecology – 55 Conservation Biology & Climate Change - 56	Enzyme Inquiry lab Enzyme simulation of inhibitors (at home lab) Photosynthesis leaf disk lab Photosynthesis inquiry investigation Tic-Tac-Toe (project) Cell Respiration Inquiry lab Comparing Concepts – Fermentation Inquiry lab (at home) Carbon Cycle Ecological Issue Sea Turtle Reading
Unit 4: Meiosis and Mendel	Meiosis and Sexual life cycles – 13 Mendel and the Gene Idea – 14 Chromosomal Basis of Inheritance - 15	Meiosis modeling Genetics problem sets Artificial Selection Lab Bioethics research * Winter Fun Pack
Unit 5: Genetics, DNA & Protein Synthesis	Molecular Basis of Inheritance – 16 Gene to Protein – 17 Regulation of Gene Expression – 18 Cell Communication – 11 Biotechnology – 20	M&M chi-square analysis Genetic scientist table & presentation Practicing Biology: Hereditary Material DNA & Histone Model Sickle Cell Anemia Biotechnology Folder: Transformation & Electrophoresis labs Bacterial Growth Curve Operons & Controls (PITX1) Eukaryotic Regulation Modeling Mutations
Unit 6: Evolution in Populations	The Evolution of Populations – 23 The Origin of Species – 24 Phylogeny and the Tree of Life – 26 Population Ecology – 53 Community Ecology - 54	Hardy-Weinberg Lab Phylogeny Project What Darwin Never Knew BLAST lab Energy Dynamics lab HW problem set Evolution reading Sea Otter case study *Spring Sting Packet
Unit 7: Bacteria, Viruses and Immune System	Virus Structure and Function – 19 Bacteria and Archae – 27 Immune System – 43	Virus Models HIV fact sheet Abracadabra Case Study Conjugation Activity Immune system analogy
Unit 8: Nervous and Endocrine System	Cell Communication – 11 Endocrine system – 45 Plant Responses – 39 Neurons, Synapses & Signaling – 48 Nervous System - 49	Plant Hormone Ad Rise and Fall of Glucose Endocrine around the room Jumping the Gap Lights, camera, action potential Feedback loops and signal

		transduction Bioflix: How synapses work Blockheads
Unit 9: Yearly Projects, JAE and Lab activities	Project presentations,	- Final Journal article & Labs Possible labs include - dive response - flower structures - moss, lichen, fern - salivary amylase lab - thermal pollution

AP Required Labs & Science Practices (SP)

	SP1	SP2	SP3	SP4	SP5	SP6	SP7
BLAST (big idea 1)	x		x	x	x		
Hardy-Weinberg (big idea 1)	x	x			x		
Artificial Selection – WFP (big idea 1)	x	x			x		x
Cellular Respiration (big idea 2)	x	x	x			x	x
Photosynthesis leaf disk lab (big idea 2)					x		
Photosynthesis inquiry lab (big idea 2)	x	x	x	x	x	x	x
Fermentation Inquiry Lab (big idea 2)	x	x	x	x	x	x	
Diffusion and Osmosis (big idea 2)	x	x	x	x	x	x	
Cell division – Mitosis and Meiosis (big idea 3)	x		x	x	x		
Biotechnology lab 1: Creating a recombinant plasmid (big idea 3)			x			x	
Biotechnology lab 2 : Gel electrophoresis restriction enzyme analysis (big idea 3)		x	x		x	x	
Biotechnology lab 3: Bacterial transformation (Big idea 3)			x		x	x	x
Energy Dynamics Lab (big idea 4)	x	x	x	x	x	x	x
Pill bug behavior lab (big idea 4)	x		x	x	x	x	x
Transpiration lab (big idea 4)		x	x	x	x	x	x
Enzyme Inquiry Lab (big idea 4)				x	x	x	x

