

AP Biology Syllabus 2017-2018

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Help sessions:

- Tuesday & Thursday 2:15-3:10. Make an appointment to ensure instructor availability.

Text: *Principles of Life 1st Edition* and *Campbell Biology 6th edition*

Expectations: Now is an exciting time to be taking AP Biology. The College Board has just reviewed the new curriculum which focuses on enduring, conceptual understanding and the content that supports them. This approach will hopefully enable you to develop inquiry-based learning of essential concepts and less of the facts. Remember that AP is a college course and requires effort and good time management.

Goals of the Course: Big Ideas and Concepts: The AP Biology examination continues to focus on the 4 Big Ideas which has a set of Enduring Understandings which incorporate core concepts that students should retain, which is followed by the essential knowledge students must develop over the course. An emphasis will also be placed on science practices that enable students to develop and refine testable predictions and explanations.

AP Biology at our school will focus on the big ideas. Each unit is organized and taught with great attention to the Big Ideas below. Lessons are designed to interweave the Big Ideas throughout the course.

The Big Ideas are:

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

Course Planner: AP Biology is organized into fourteen units. Every unit is designed to integrate the topic into the four big ideas and the essential knowledge within the enduring understanding. Throughout each unit, we discuss how the unit ties back into all of the big ideas.

Unit	Topics	Reference	Laboratories
1- Biochemistry	Water, bonding, pH, macromolecules, Protein structure and function, enzymatic activity	POL CH 2-3 Campbell CH 2-5	Enzyme Lab
2-Cell structure, function and cell communication	Prokaryotes vs Eukaryotes, Cell organelles (structure and function), Cell membrane (structure and function), Signal transduction	POL CH 4-5, 7 Campbell CH 7-8, 11	Diffusion/Osmosis Lab Cell Signaling Models

	pathways, G-proteins, Tyrosine kinase, role of membranes in cell signaling, secondary messengers		
3- Cellular Energy (metabolism/Cell Respiration/ Photosynthesis)	Metabolism, ATP, Cell respiration, Photosynthesis, evolution of alternative mechanisms of carbon fixation	POL CH 6 Campbell CH 6, 9-10	Cell Respiration Lab (probeware) Leaf disk assay Lab
4- Cell Cycle, Mitosis, DNA structure, Replication, Biotechnology	Mitosis/cell cycle, DNA structure & replication, Recombinant DNA, Restriction enzymes, Bacterial Transformation, DNA gel electrophoresis	POL CH 7, 9, 13 Campbell CH 12, 16, 20	Mitosis lab – chi square DNA Replication Activity Bacterial Transformation Gel Electrophoresis
5- Protein Synthesis Prokaryotic and Eukaryotic Gene Regulation	Protein Synthesis, Gene regulation (prokaryotic and eukaryotic)	POL Ch 10-12 Campbell CH 17-19	Protein Synthesis/Mutation Lab Operon Modeling Epigenetics Lab
6- Meiosis and Mendelian Genetics	Meiosis and reproduction Mendelian inheritance patterns, non-mendelian inheritance patterns, Chi-square analysis, evolutionary significance of genetic variation, gene linkage	POL CH 8-9 Campbell CH 14-15	Chromosome mapping, Chi-Square lab
7 - Evolution	Origin of life, Darwin & decent with modification, origin of species, adaptations, speciation, behavior patterns, genetics, sexual selection and reproductive success, phylogeny and the tree of life, Bacteria and Archae	POL CH 15-19 Campbell CH 22-28	Hardy Weinberg Great Clade Race BLAST lab HHMI Evolution/Genetics Lab sets
8 -Immune System	Non-specific immune response, inflammatory response, Humoral and Cellular immune responses	POL CH 31 Campbell CH 43	ELISA Lab
9- Endocrine System	Homeostasis, temperature regulation, osmoregulation, hormones, female menstrual cycle,	POL CH 29-30, 32, 40 Campbell CH 44-46	Homeostasis Lab
10- Nervous System	Neuron structure, sodium potassium pump, action potential, synapses, neurotransmitters, chemoreceptors, photoreceptors, mechanoreceptors	POL CH 34-35 Campbell 48-49	Action Potential Modeling Brain Cap Activity
11- Botany (after AP exam)	Evolution of plants, Alternation of generations, Angiosperm structure and growth, Angiosperm reproduction and growth Plant control systems	POL CH 21, 24-28 Campbell CH 29-30, 35-39	Transpiration lab
12 –Ecology Spring Break	Interactions between organisms and the environment, ecosystems, conservation, animal behavior	POL CH 41-46 Campbell CH 50-55	Energy Dynamics Animal Behavior

Materials:

- Large 3 ring binder with dividers for each unit (required daily)
- Black or blue pen and pencils (required daily)
- Textbook – Leave Campbell at home and USE it.
- **Some of the required outside work for this class requires the use of a computer and the internet.** If you do not have access to this equipment at home you will need to make arrangements to do some of your work before/after school in the media center or public library.

Classroom Procedures:

- The student will...
 - Be responsible for one's own property and behavior.
 - Observe and follow rules stated in the student handbook.
 - Bring required materials to class daily.
 - Be prepared for class or lab by completing the required readings or assignments ahead of time.
 - Turn in all assignments on time.
 - Be on time for class.
 - Refrain from eating or drinking in class. (Remember you are in a science lab.)
 - Refrain from using cell phones or other electronic devices for the purposes of communication or entertainment.
 - Cell phones must be turned in for all quizzes and tests or when any test material is out.
 - Refrain from touching any equipment unless instructed to do so by the instructor.
 - Read, understand, sign and return the safety contract
 - Stay awake and participate appropriately in class.
- Failure to comply with classroom behavioral expectations will result in...
 - Teacher/student conference (hopefully this is where it ends)
 - Contact with parents (next step)
 - Referral to appropriate administrator (last resort)

Assignments:

- Assignments will be written on the whiteboard weekly. Due dates for readings, homework, labs and assessments will be posted on the board AND the AP Biology website .
- **It is the student's responsibility to adhere to the due dates and pacing schedule provided for weekly assignments.**

Make up Guidelines:

- On your first day back to class you must provide proof of excused absence.
- It is the student's responsibility to schedule make up assessments, presentations and labs. These should be made up promptly. The window for making up labs is very small due to space and the short life of lab materials.
- **If a student is absent any day during a unit (including the day before the test), the student is still required to take the test on the given day.**
- If a student is absent the day of a test, the student should attempt to make up the test the next day. If you do not make up the test within the time frame outlined in the Student' Rights and Responsibilities Handbook, the instructor may give you a zero for the test. It is not fair to other students in the course to give you extended time to study and prepare for a test. Absences must be excused.

Evaluation

- Evaluation of this course will consist of homework, labs, quizzes, projects and tests.
- All tests will consist of parts, a multiple choice section and a free response section.
- Tests will be graded on an AP sliding scale.
- Newport News Public School grading scale will be used:

- A = 100-90
- B = 89-80
- C = 79-70
- D = 69-60
- F = 59-0
- Each quarter grade will be determined using the following weights:
 - Tests – 40%
 - Quizzes – 20%
 - Homework/Classwork/Activities/Projects– 20%
 - Lab exercises and reports – 20%
- Semester average:
 - 1st Quarter – 40%
 - 2nd Quarter – 40%
 - Semester exam – 20%

AP Exam

- Students are expected to take the AP exam. The AP exam scores are not received until early July. These scores are therefore not used as a part of a student’s average in the course. **The exam will be Monday, May 14, 2018 at 8:00AM.**
- Below is the AP exam format.

Section I		
Question Type	Number of Questions	Timing
Part A: Multiple Choice	63	90 minutes
Part B: Grid-In	6	
Section II		
Question Type	Number of Questions	Timing
Long Free Response	2	80 minutes + 10-minute reading period
Short Free Response	6	

This syllabus is a living document and subject to change at any time by the discretion of the instructor.

AP Biology credit at select Virginia Colleges and Universities:

School	Score required	Credit given
UVA	4	6 credits
	5	8 credits
VA Tech	4	4 credits
	5	8 credits
JMU	4	8 credits
VCU	3/4	4 credits
	5	8 credits
UMW	3	4 credits (non-major)
	4/5	8 credits
William and Mary	5	4 credits
W&L	5	4 credits (non-major elective)
George Mason	4/5	8 credits
ODU	3	4 credits
	4/5	8 credits
CNU	4	7 credits

