

# AP Biology/Course Syllabus 2013-2014

This college level course is designed to give you an understanding of biological concepts while emphasizing their application in our world. The College Board recognizes four “Big Ideas” underlying the study of Biology which we will focus on throughout the year. Over the course of the year you will notice that there is a great deal of overlap between the Big Ideas and that some topics and themes will be repeated as we study each Idea. The Ideas are as follows.

Big Idea 1- The process of evolution drives diversity and unity of life

Big Idea 2 – Biological systems utilize free energy and molecular building blocks to grow, reproduce, and to maintain homeostasis.

Big Idea 3 – Living systems store, retrieve, transmit, and respond to information essential to life processes.

Big Idea 4 – Biological systems interact, and these systems and their interactions possess complex properties.

## Expectations

Time is of the essence in this class, so I expect you to be prepared for class every day. This includes not only being on time and having the appropriate materials (listed at the end of this syllabus), but also having read the assigned text or articles. You should be ready to ask and answer questions, discuss ideas from the reading, and know the appropriate vocabulary – writing definitions in your notebook when necessary. Occasionally I will give reading quizzes, announced or not, to encourage you to keep up with the assignments. Although it is important to know and memorize some facts, the focus of the course will be on critical thinking and application of your knowledge.

The next few pages show the topics and subtopics to be studied as well as a projected timeline, activities and readings for each topic, and the type of assessment used for each. You will be expected to read any chapters or sections assigned and will be assessed on material in the reading even if we did not cover it fully in class. To make room for labs and other hands-on activities (about 25% of our class time), lectures will be limited to broad concepts and topics that may be more difficult to understand.

## Topics/Proposed Timeline

Unit	Topic	Activities and Reading*	Assessment
Summer	<ul style="list-style-type: none"> <li>• Summer Reading</li> <li>• Introduction – Themes and Evidence for evolution</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Genome</i> by Matthew Ridley</li> <li>• Chapters 1 and 22</li> </ul>	<ul style="list-style-type: none"> <li>• Blog discussion on <i>Genome</i> including ethical questions raised in each chapter</li> <li>• Chapter Quizzes</li> </ul>
Big Idea 1	<ul style="list-style-type: none"> <li>• Mechanisms for Evolution</li> <li>• Evolution of Populations</li> <li>• Phylogenetics/Cladistics</li> <li>• Speciation</li> <li>• Origin of Life</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter 23</li> <li>• Lab 2: Hardy Weinberg Mathematical Modeling</li> <li>• Chapter 26</li> <li>• Lab 3: Comparing DNA Sequences</li> <li>• Chapter 24</li> <li>• Chapter 25</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter or Unit Quizzes</li> <li>• Lab reports and/or presentations</li> </ul>

<b>Unit</b>	<b>Topic</b>	<b>Activities and Reading*</b>	<b>Assessment</b>
Big Idea 2	<ul style="list-style-type: none"> <li>• Cells</li> <li>• Cell Membranes and Membrane Transport</li> <li>• Biochemistry</li> <li>• Homeostasis</li> <li>• Development as related to cell differentiation and regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Chapters 6-10</li> <li>• Lab 4: Diffusion and Osmosis</li> <li>• Lab 6: Cellular Respiration</li> <li>• Chapters 3-5</li> <li>• Activity 1 from Biological Inquiry: A Workbook of Investigative Case Studies, 2nd Edition</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter or Unit Quizzes</li> <li>• Lab Reports and/or presentations</li> </ul>
Big Idea 3	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Genetics</li> <li>• Gene Regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Chapters 11-20</li> <li>• Modeling Mitosis and Meiosis</li> <li>• Modeling DNA replication</li> <li>• Lab 8: Bacterial Transformation</li> <li>• Modeling protein Synthesis</li> <li>• Lab 9: Restriction Enzyme Analysis of DNA</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter or Unit Quizzes</li> <li>• Lab Reports and/or presentations</li> <li>• Research Project – Cellular communication pathways</li> </ul>
Big Idea 4	<ul style="list-style-type: none"> <li>• Ecology</li> <li>• Body systems</li> <li>• Plant systems</li> <li>• Review of Enzymes</li> </ul>	<ul style="list-style-type: none"> <li>• Chapters 51-55</li> <li>• Lab 11: Transpiration</li> <li>• Selected sections of Chapters 45,48 and 49</li> <li>• Enzyme stop motion animations</li> <li>• Lab 13: Enzyme Activity</li> </ul>	<ul style="list-style-type: none"> <li>• Chapter or Unit Quizzes</li> <li>• Lab Reports and/or presentations</li> </ul>
Review	• Review Major Concepts		
<b>AP BIOLOGY EXAM – Monday, May 12</b>			
May 13-16	• Comparative Anatomy	• Dissections	• Lab Practical – Identification of studied parts
<b>SENIOR EXAMS</b>			
After Senior Exams	• Current Events/Bioethical Issues	<ul style="list-style-type: none"> <li>• Current articles, opinion pieces, book excerpts</li> <li>• Class discussions/debate</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion participation</li> <li>• Debate preparedness</li> <li>• Persuasive essays</li> </ul>
<b>FINAL EXAMS – June 9-12</b>			

\*In addition to the textbook readings, additional articles and readings will be assigned based on class discussions and what is most currently available on each topic. As we begin each unit you will receive a more detailed plan of the readings, homework, activities, and assessments.

### Student Investigations

To better understand the process of science and the importance of investigation and good lab practice, you will be required to design one follow up to a lab done in class or design a unique experiment to answer a specific question you have about an area of Biology. A complete proposal including a question, hypothesis, materials, procedure and expected results should be submitted for review. You will then carry out the experiment on your own time (using the Biology lab if necessary) and write a full lab report including the actual materials and procedure, data, results, conclusion, and discussion. This may be done at your own pace and turned in at any time, but must be completed and handed in by April 29th.

### Open Response Questions

Each open response question will focus on a relevant topic in society. You will be required to answer a specific question by applying what you have learned in class to a current environmental or social issue.

### Journal Readings/Current Events Roundtable

Every other week, you will be required to read and summarize key points of published scientific research. Once a month you must choose a reading from a scientific journal, while a current news article reporting on research will be acceptable for the remaining weeks. Your summary should contain the keys points of the article and also an explanation of how it connects to material we have covered in class.

Once a week, a few students will be called on to report on their reading and lead a discussion on the significance of the research and results. This includes the connection to the content, how the research may be applied, additional questions, and ethical issues that may be raised from the research.

### Materials

#### Required

- Textbook - Campbell, Neil A., and Jane B. Reece. *Biology 8<sup>th</sup> Edition – AP Edition* (provided)
- Binder – at least 1½” rings – D rings are better since they allow more papers to fit
- Loose leaf paper
- Pen AND pencil with eraser
- Lab notebook
- USB Flash Drive

#### Recommended

- Highlighters
- Colored pencils (36 colors)
- AP Test prep. book such as Barrons, Kaplan, 5 Steps to a 5, *Test Prep Series: AP Biology* by Neil A. Campbell and Jane B. Reece

### Extra Help

I will be available for extra help before and after school according to the schedule provided in class. I am generally available any other day before or after school if you let me know you are stopping in. I will also offer extra help sessions before quizzes/tests.