



EAGLE RIDGE ACADEMY

AP[®] Biology Syllabus – 2018-2019

Instructor Information

Course: AP Biology

Credit: Year-long (1 credit)

Location & Time: Room 1606

Instructor: Mr. Meier

Phone: 952-746-7760 (main school line)

Availability: Before and after school

Email: bmeier@eagleridgeacademy.org

Website: meierscience.net

Textbook

Provided Text:

Reece, Jane et al, *Campbell Biology (9th Edition), AP Edition*, Benjamin Cummings, 2011.

Selections from *AP Biology Test Prep Series (to accompany Campbell Biology, 9th Edition)*

Other readings will be provided as needed

Course Overview

AP Biology is a year-long course which is designed to be taken by students after the successful completion of both high school biology and chemistry. AP Biology includes those topics regularly covered in a college introductory biology course and differs significantly from the standards-based, high school biology course with respect to the kind of textbook used, the range and depth of topics covered, the kind of laboratory work performed by students, and the time and effort required of the students. The textbook used by AP Biology is also used by college biology majors and the kinds of labs done by AP students are similar or equivalent to those done by college students. AP Biology is a course that aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. This course is designed to prepare students for the Biology College Board Advanced Placement Exam.

AP Exam: Monday, May 13, 2019 @ 8:00am

It is expected that all students enrolled in class will register and take the AP Biology exam. There is an addition cost for taking the exam. This amount will be determined at a future date based on varying factors. Assistance may be available. Additional information about the exam will be provided at a future date. Given its rigorous nature, we will spend time during the year talking about exam strategies, looking at questions from previous tests, and reviewing important concepts. In addition, the typical format of our unit tests will be much the same as the AP test. As a guide, the 2018 exam contained:

- **Section 1 (69 questions, 90 minutes, 50% of exam score)**
 - 63 Multiple choice questions
 - 6 Grid-in questions (*focus on math skills, requires calculation of answers*)
- **Section 2 – Free Response (8 questions, 90 minutes, 50% of exam score)**
 - 2 Long Response (*1 is lab or data-based*)
 - 6 Short Response (*each requiring a paragraph-length response*)

Required Materials

- Three-ring binder of at least 2" with Dividers (*for portfolio*)
- Loose-leaf paper and/or notebook (*for notes, etc*)
- One NEW **quadrille-ruled composition notebook** (*for lab work*)
- Calculator (*minimum of scientific, can be graphing as used for math*)
 - **The College Board allows use of a 4-function, scientific, or graphing calculator for the AP Exam**

Expectations for Success / General Class Expectations

- Come to class every day on time
 - The difficulty and intense nature of this class makes it incredibly difficult for students to catch up after missing class*
- Complete the required reading assignments PRIOR to coming to class
 - The immense amount of content will require much initial comprehension outside of class time*
- Dedication & a commitment to academic achievement
 - You will get out of this class only what you are willing to invest*
- Follow expectation as set in Student Handbook (*school uniform, food/drink in classrooms, electronics*)
- Follow laboratory safety rules and adhere to the Safety Contract

Remember, AP Biology is a rigorous course which demands dedication and personal responsibility from each student. Due dates will be provided for any projects, labs, and assessments, but to do well throughout the course students are strongly encouraged to complete nightly readings and study each day's lecture notes on their own time.

Classroom Management

- Discipline will be handled within the classroom as often as possible for minor disturbances
 1. The student will be asked to stop their behavior
 2. If the behavior does not change the student will be moved within the classroom
 3. The student will be removed from class and sent to an administrator
- Laboratory discipline will follow conditions outlined in the Science Safety Contract
- Additional discipline will follow the Student Handbook

Attendance & Late Work

- Tardy & Unexcused Absence follow expectations as set in the Student Handbook
- For Excused Absence, it is the **student's responsibility to obtain & complete missed work**
 - Homework is due as set in the Student Handbook
 - Make-up Exams must be scheduled on an individual basis
- **Late work will not be accepted**

Grades

- Weighted based on assignment type
 - Assessments & Quizzes 40%
 - Labs & Lab Reports 40%
 - Homework & Readings 20%
- Semester grades broken down based on Eagle Ridge grading policy
 - Quarter 1 40%
 - Quarter 2 40%
 - Semester Final 20%
- Quarter & Semester letter grades based on Eagle Ridge grading policy (A-90%, B-80%, C-70%, etc)
- Grade book will be updated about once/week

The Big Ideas

The AP Biology Curriculum is framed around four Big Ideas. Each Big Idea has a set of core concepts called Enduring Understanding. These are the main topics used to guide the AP Biology course curriculum. The outline below illustrates the AP Biology Curriculum Big Ideas and the Enduring Understandings topics covered in class.

Big Ideas	Enduring Understanding
One: The process of evolution drives the diversity and unity of life.	<ul style="list-style-type: none">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.
Two: Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.	<ul style="list-style-type: none">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 system's environment.E. Many biological processes involved in growth, reproduction, and dynamic homeostasis include temporal regulation and coordination.
Three: Living systems retrieve, transmit, and respond to information essential to life processes.	<ul style="list-style-type: none">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.
Four: Biological systems interact and these interactions possess complex properties.	<ul style="list-style-type: none">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.

The Big Ideas, cont.

Since these ideas are interrelated, they will not be taught in isolation, but will instead be connected by linking the enduring understanding from one Big Idea to another wherever practical. Examples of additional activities and how the Big Ideas will be connected to one another are shown below. There will be many more activities presented here.

Big Idea 1

EU 1.B Organisms are linked by lines of descent from common ancestry.

- Students will be provided with amino acid data sets and will be required to order them on a cladogram to correctly show evolutionary history and speciation.

→ BI 3 Living systems retrieve, transmit, and respond to information essential to life processes.

- Students will discuss similarities and differences in the process across different domains.

Big Idea 2

EU 2.A Growth, reproduction, and maintenance of the organization of living systems require free energy and matter.

- Students will compare and contrast anaerobic and aerobic respiration pathways.

→ BI 1 The process of evolution drives the diversity and unity of life.

→ BI 4 Biological systems interact and these interactions possess complex properties.

- Students will draw a model of organelles involved in helping a plant obtain a constant input of free energy to illustrate and identify the evidence that mitochondria and chloroplasts evolved from free-living organisms.

Big Idea 3

EU 3.A Heritable information provides for continuity of life.

- Students will conduct a fruit fly genetics laboratory involving the crossing of two or more genes in order to determine whether the selected traits follow Mendelian patterns of inheritance.

→ BI 1 The process of evolution drives the diversity and unity of life.

- Students will review the experimental designs leading to the demonstration that DNA is the genetic material for all living organisms on Earth.
- Discussion of mechanisms that increase genetic variation and the relationship to evolutionary fitness

Big Idea 4

EU 4.A Interactions within biological systems lead to complex properties.

- Animated Investigation: How do Abiotic Factors Affect Distribution of Organisms? - Students will use a simple model for observing ecological impact that occurs when single abiotic factors are changes. By changing abiotic factors, data can be collected and analyzed. (www.campbellbiology.com), Chapter 52

→ BI 3 Living systems retrieve, transmit, and respond to information essential to life processes.

- Students will identify cellular components (such as ribosomes) and explain how individual parts come together to allow for a complex functioning (such as protein synthesis).

Laboratory Component & Science Practices

In addition to the Big Ideas, the AP Biology course is also structured around inquiry in the lab and the use of the seven science practices. The experience is used to emphasize that biology and science is a process involving the development of a hypothesis, collection of data, and analysis of results.

To ensure the laboratory component of the course is met, a minimum of 25% of class time will be devoted to lab work. A minimum of two inquiry-based investigations will be conducted per Big Idea as required by the course. Inquiry labs are taken from *AP Biology Investigative Labs: An Inquiry-Based Approach* (below). Because the Big Ideas are interrelated, the inquiry-based investigations will not necessarily be conducted in this order. In addition to these inquiry-based labs, additional labs will supplement these to emphasize and deepen understanding of content covered in class.

The Seven Science Practices (SP)

The student can (is):

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

The table below illustrates how each of the 13 inquiry labs relate to the science practices and the big ideas. Only science practices that will be emphasized have been checked. Most of the inquiry labs use all of the practices.

Description	SP1	SP2	SP3	SP4	SP5	SP6	SP7	BI1	BI2	BI3	BI4
Investigation 1 Artificial Selection	X	X			X		X	X			
Investigation 2 Hardy-Weinberg Investigation	X	X			X			X			
Investigation 3 Comparing DNA Sequences with BLAST	X				X			X		X	
Investigation 4 Diffusion & Osmosis		X		X	X				X		X
Investigation 5 Photosynthesis	X	X	X	X		X	X		X		
Investigation 6 Cellular Respiration	X	X	X			X	X		X		
Investigation 7 Cell Division: Mitosis & Meiosis	X				X	X	X	X		X	
Investigation 8 Bacterial Transformation	X		X		X	X	X	X		X	
Investigation 9 Restriction Enzyme Analysis			X			X				X	
Investigation 10 Energy Dynamics	X	X	X	X	X	X	X				X
Investigation 11 Transpiration	X	X		X		X	X		X		X
Investigation 12 Fruit Fly Behavior	X		X	X	X	X	X				X
Investigation 13 Enzyme Activity					X	X	X		X		X

Laboratory Component & Science Practices, cont.

Students will maintain a written record of investigations conducted. In addition, they will be asked for the following throughout the course:

- Formal lab reports that emphasize the development and testing of a hypothesis; collection, analysis, and presentation of data; and a clear discussion of results.
- Poster presentations illustrating the main investigation components; presenting to small groups or the whole class; fielding questions

Social & Ethical Concerns

It is essential that students connect their classroom knowledge to socially important issues. AP Biology will allow students to learn about, and discuss, many issues in a variety of formats. Issues will be discussed in a class setting, both live and electronically. Discussion formats may include online forums, research papers, debate, and presentations on current topics having social or ethical issues associated with them. Since the goal is to discuss timely events, the list below is simply an illustration of news issues that continually appear, but will not necessarily be discussed during class.

- Stem Cell Research (Big Idea 3)
- Climate Change & Global Warming (Big Idea 4)
- Antibiotic Resistance and the Problems with Improper Antibiotic Use (Big Idea 1)
- Genetically Modified Food (Big Idea 3)
- The Use of Genetic Information (Big Idea 3)

Homework & Readings

Reading and homework can be expected daily, including over weekends and vacations (though these will be minimized to follow ERA Handbook guidelines). Assignments are available on the course website. Most assignments will be problems from the textbook, however there will be handouts in class on occasion. Most homework will be handed in and graded.

Readings for class include chapters from the textbook. Scientific abstracts and papers are assigned with the purpose of showing how discoveries are made and demonstrate that science is the process. Articles found in science magazines and online news sources may also be assigned to promote discussion about social and environmental concerns.

2018-19
AP Biology
Eagle Ridge Academy

Statement of Understanding

By signing this contract, the parent and the student acknowledge that they have read the syllabus for AP Biology class at Eagle Ridge Academy and that they *understand* and *agree* to the commitment necessary to be successful in this course.

Please complete the information below and return this statement of understanding to Mr. Meier by ***Tuesday, September 4.***

Parent or Guardian

Preferred Contact Method? Phone Email Both

Phone number: _____

Email address: _____

Student Name (Print)

Student Signature

Date

Parent or Guardian Name (Print)

Parent or Guardian Signature

Date