

AP Biology Summer Assignment

2022-2023



The two main goals of AP Biology are to help you develop a conceptual framework for modern biology and to gain a deeper appreciation for science as a process (rather than as an accumulation of facts). The AP biology curriculum is focused around four Big Ideas, and you will need to not only know the information that supports these central tenants but also understand how they all relate to each other.

The four big ideas are listed below:

- **System Interactions:** Biological systems interact, and these interactions possess complex properties.
- **Information Storage & Transfer:** Living systems retrieve, transmit, and respond to information essential to life processes.
- **Energetics:** Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.
- **Evolution:** The process of evolution drives the diversity and unity of life.

These Big Ideas stretch across and through the eight units of material that we will cover in depth this upcoming year. To provide us the maximum amount of time possible with the curriculum, you will be responsible for reviewing some of the material on your own this summer. This summer, we will focus on topics from Unit 8 which focuses on the study of ecology and the understanding of ecosystem interactions and functions.

Your assignment will consist of six parts. Links to each of these parts are included below (in a variety of formats) along with the required text selections and (*optional*) video lectures.

	Text	Assigned Questions (Choose One Format)			Video Lecture
1. Topic 8.2 – Energy Flow Through Ecosystems	Topic 8.2	Google	Word	PDF	Topic 8.2
2. Topic 8.3 – Population Ecology	Topic 8.3	Google	Word	PDF	Topic 8.3
3. Topic 8.4 – Effect of Density on Populations	Topic 8.4	Google	Word	PDF	Topic 8.4
4. Topic 8.5 – Community Ecology	Topic 8.5	Google	Word	PDF	Topic 8.5
5. Topic 8.6 – Biodiversity	Topic 8.6	Google	Word	PDF	Topic 8.6
6. Topic 8.7 – Disruptions to Ecosystems	Topic 8.7	Google	Word	PDF	Topic 8.7

All parts of the summer assignment can be uploaded using this [Google Form](#), emailed to Mrs. Heuer via her school email (mackenzie.heuer@boone.kyschools), or turned in by the due date.

This assignment is not officially due until **Friday, August 19th**. Don't worry about getting everything done in one go!

It is suggested that you use your summer to rest and recuperate following a long school year. Some of you may be involved in other activities or may be taking other course that require you to complete a summer assignment. Assignments are not required to be completed immediately upon receiving, however it is suggested that you work on at least one part a week.

	Whole Summer Suggested Schedule	Half Summer Suggested Schedule	
Topic 8.2	June 6 th , 2022	June 6 th , 2022	July 11 th , 2022
Topic 8.3	June 13 th , 2022	June 8 th , 2022	July 13 th , 2022
Topic 8.4	June 20 th , 2022	June 13 th , 2022	July 18 th , 2022
Topic 8.5	July 11 th , 2022	June 15 th , 2022	July 20 th , 2022
Topic 8.6	July 18 th , 2022	June 20 th , 2022	July 25 th , 2022
Topic 8.7	June 25 th , 2022	June 22 nd , 2022	July 27 th , 2022

Note: The dates above are merely suggestions and you are allowed to complete these at whatever pace works best for you.

If you have any trouble accessing the materials or require a hard copy at any point in time, please do not hesitate to let me know.

The remainder of this document includes the tentative 2022-2023 AP Biology syllabus, which is subject to change prior to the beginning of the school year. We will discuss this in class, but use the material provided for preparation purposes for an awesome school year! Can't wait to meet you!



**AP Biology 2022-2023
Information & Expectations**

Mrs. Mackenzie Heuer

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Room 305

Course Description

This AP Biology course is designed to offer students a solid foundation in introductory college-level biology. By structuring the course around the four big ideas, enduring understandings, and science practices, I assist students in developing an appreciation for the study of life and help them identify and understand unifying principles within a diversified biological world.

What we know today about biology is a result of inquiry. Science is a way of knowing. Therefore, the process of inquiry in science and developing critical thinking skills is the most important part of this course. At the end of the course, students will have an awareness of the integration of other sciences in the study of biology, understand how the species to which we belong is similar to, yet different from, other species, and be knowledgeable and responsible citizens in understanding biological issues that could potentially impact their lives.

Being that this is a college-level course with lab, students should expect a workload equal to what would be encountered in a 4-hour college course. Time outside class will include almost-daily reading assignments, completing pre-labs or post-lab assignments, and research/study needed to be prepared for activities and assessments in class.

Big Ideas

This AP course is structured around the four big ideas, the enduring understandings within the big ideas and the essential knowledge within the enduring understanding. The Big Ideas are listed below:

- **System Interactions:** Biological systems interact, and these interactions possess complex properties.
- **Information Storage & Transfer:** Living systems retrieve, transmit, and respond to information essential to life processes.
- **Energetics:** Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.
- **Evolution:** The process of evolution drives the diversity and unity of life.

Science Practices

The AP Biology exam is based on specific learning objectives which are used to design the lessons and activities of this course, which combine science practices with specific content. In this class, students will focus on the following skills and practices:

- | | |
|---------------------------------------|----------------------------------|
| • Concept Explanation | • Visual Representations |
| • Questions and Methods | • Representing & Describing Data |
| • Statistical Tests and Data Analysis | • Argumentation |

Unit Outline

- Unit 0** Statistics and Methods
- Unit 1** The Chemistry of Life
- Unit 2** Cell Structure and Function
- Unit 3** Cellular Energetics
- Unit 4** Cell Communication
- Unit 5** Heredity
- Unit 6** Gene Expression & Regulation
- Unit 7** Natural Selection
- Unit 8** Ecology*

Tentative Test Dates

Grading Policy

Term Grade	90%
Formative Assignments.....	30%
<i>Reading Quizzes</i>	20%
<i>Preparatory Assignments</i>	10%
Summative Assessments.....	70%
<i>Lab Reports</i>	20%
<i>Unit Exams</i>	40%
Term Final Project	10%

Please do not wait until the final week of the term to be concerned with your grade.

Suggested Materials

- Paper, Graphing and Notebook
- Calculator
- Highlighters, 2 Colors
- Chromebook & Charger
- Black or Blue Ink Pen
- 3-Ring Binder, 1.5" – 2"
- AP Biology Prep Book
- Course Textbook

Class Expectations

- Be seated when class begins, with all necessary materials.
- Keep personal technology (cell phones, headphones, etc.) out of sight and on silent.
- Follow all policies, not otherwise noted, outlined in the Student Handbook.
- Be respectful to peers, instructor, and classroom environment.
- Attend class regularly and stay up-to-date with assignments.
- Remain in the classroom unless an emergency occurs.

Formative Assignments

Outside of class time, students will be expected to complete a variety of tasks designed to prepare them for in-class collaborative work. For the 2022-2023 school year, we will be employing a modified "flipped classroom". In a flipped classroom environment, material will be introduced through at-home preparatory assignments such as:

- Assigned Reading & Notetaking
- Pre-Lab Research & Preparation
- Short Summation Assignments
- Weekly Reading Quizzes

Students may be assigned up to two reading passages a week, which will cover the topics/knowledge required to provide foundational learning for in-class work. For these assigned readings, students may utilize suggested notetaking strategies (i.e., Cornell method, Outline method, Concept Mapping, etc.).

Summation assignments are designed to employ information learned in class and through assigned readings to get students to think critically about the material. Summation assignments will include between 5-10 short questions that can be completed following the reading assignment.

Laboratory exercises are important facets to an AP Biology Course. Over the course of the year, we will conduct at least 10 of the 12 major labs required by the College Board. Any laboratory exercises not completed directly in class will be reviewed for details that may pertain to the AP Exam.

In preparation for laboratory exercises completed in-class, students may be expected to complete preparatory research and pre-lab exercises prior to the lab. Completing pre-lab work will help students to excel with the laboratory expectations and procedures and will aid students in later post-lab reporting.

Weekly reading quizzes will make up the primary basis of student's scores for formative assignments. Students will complete these quizzes as **open-note** assessments, designed to test students understanding of topics covered in the assigned readings.

Summative Assessments

Class tests are structured much like the AP exam and consist of a multiple-choice portion and a free response portion, each worth 50% of the exam grade. Typically, each section is 30 minutes in length and there will not be an extension of time if a test is not completed in the allotted time frame.

Multiple Choice

Tests will include approximately 25 multiple choice questions. The multiple-choice portion of the Unit Exam is designed to be completed in a 30-minute time frame.

Free-Response

Tests will include 1 "long" and 1 "short" free response question. Free response questions are answered in essay form and will not be graded if complete sentences are not used.

Lab reports are required for each of the recommended laboratory exercises. These reports may include title, introduction, background information, purpose, hypothesis, procedure, data/results, analysis, question, and conclusion. Students work in pairs to complete lab procedures but are responsible for turning in individual lab reports. Students are encouraged to produce a high-quality report and are given a week from the conclusion of the lab to submit their report.

Course Policies

Attendance

AP Biology is a demanding course and will be taught as if it were an actual college course. Students are expected to complete assigned readings and review their notes on a frequent basis, regardless of if it has been assigned. As in college courses, students will be held responsible for relevant material even if it is not covered during class. This means that if something is in the textbook, then it is fair game for assessment.

Understand that missing class time and labs may adversely affect your grade. If you are absent for any reason, including school sponsored extracurricular activities and EHO activities, it is your responsibility to request and complete the missed assignment in a prompt manner, as defined by RCHS policy. I will assist you with getting caught up, but it is the student's responsibility to seek this assistance.

All assignments and directives given in class will be additionally available on the Canvas page for this course. Students are recommended to check Canvas regularly for updates on missing assignments or directions.

Technology

Research shows that students who use personal technology during class take 62% less notes, have on average less-detailed notes, and remember less about important details. This correlates to a letter grade and a half lower score on assessments.

Per policy, a cell phone is considered a supplemental device and should not be used as a student's primary device during class time. Therefore, cell phone usage is not allowed during AP Biology unless explicitly authorized by me ahead of time.

It is expected that you will place your cell phone in the assigned pocket when you enter class. Chargers will be available if your phone needs a recharge during your separation. Each day that a cell phone is placed in the student's assigned pocket will earn him/her 1 PBIS point. PBIS points may be redeemed via stores on the PBIS website.

Learning & Relearning

At Cooper we value learning and understand that sometimes students do not learn at the same pace. We also know that many students need to develop better habits such as completing and turning in work on time, doing homework, spending time outside of class studying, and not falling behind in classes. To help improve learning and school habits, Cooper is adopting the following in all classes as it relates to learning, meeting deadlines, and reassessing:

- Students must turn in all assignments **before** the initial unit assessment (or completion of a unit) to receive a score for those assignments.
- Students who have not reached mastery on an assessment (less than 90%) may retake that assessment to replace the grade **if they made a valid first attempt**.
- To retake an assessment, students must complete relearning before retaking the assessment. This relearning is approved by the teacher but will not directly affect the course grade. Relearning may include one or more of the following:

Attend Tutoring

Completion of Relevant Assignments

Completion of Additional Work

Test Corrections

Completion of an Online Module

- The deadline for completing a reassessment is determined by the department but at least ten days after the initial assessment.

AP Information from College Board

AP Exam

The AP exam is given in May. In 2022, the AP Biology course exam was administered on May 11th. The testing date for the 2023 Exam is still **to be determined**. This exam is administered by the College Board and is given in a secure room. A student's grade received on the AP Exam does not affect a student's grade in this course.

Students are suggested to sign up to take the AP Exam by November (the official deadline date will be announced in class). There is a late fee for late sign-ups to the Exam. Students should start thinking early on whether they plan to take the exam in May.

Laboratory Manual

The laboratory exercises completed in the duration of this course will be taken from the AP Biology Laboratory Manual, which can be accessed as a PDF [here](#). The labs included are:

1. Artificial Selection
2. Mathematical Modeling: Hardy-Weinberg
3. Comparing DNA Sequences with BLAST
4. Diffusion and Osmosis
5. Photosynthesis
6. Cellular Respiration
7. Cell Division: Mitosis and Meiosis
8. Biotechnology: Bacterial Transformations
9. Energy Dynamics
10. Transpiration
11. Fruit Fly Behavior
12. Enzyme Activity

Mathematics & Statistics

In addition to the content and laboratory work of the AP Biology course, students will be expected to understand and use a series of equations necessary for calculations. The full AP Biology Formula and Equation sheet may be accessed as a PDF [here](#).

Students are suggested to have a calculator with which they are familiar in operation.

Further Information

if you would like any additional information concerning the AP Biology course or exam, it is suggested that you browse the Course and Exam Description released by the College Board. This document can be accessed as a PDF [here](#).