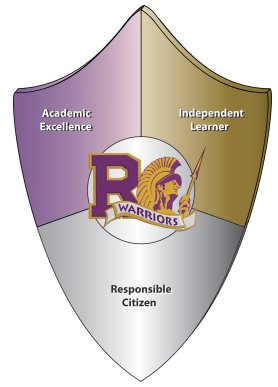


# AP BIOLOGY SYLLABUS

# 2022-2023

## Instructor's Information

Course: Advance Placement Biology (A/B)  
Instructor: Ms. R. R. Wingerden  
Phone: (805) 937-2051 x2121  
E-mail: [rwingerden@smjuhsd.org](mailto:rwingerden@smjuhsd.org)  
Website: <http://www.rwingerden.com/apbio/>



## Textbook

*Biology AP Edition* - Campbell & Reece (8th Edition)

**Course Description** AP Biology is a year-long course designed for high school students as an opportunity to earn AP credit on their high school transcript, as well as placement credit for an introductory college-level science course. Students who earn a qualifying score on the AP Biology Exam are typically eligible to receive college credit and placement in an advanced science course in college. This course is aligned to the College Board AP Biology Curriculum Framework and is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress.

This course is designed to prepare students for the **Biology College Board Advanced Placement Exam**. This course is also a **concentrator course** for the [CTE Environmental Resources Pathway](#).

## Prerequisites

Junior or Senior: Successful completion of *Physics of the Universe*, *Biology: The Living Earth*, and *Chemistry*.  
Sophomore: Accelerated NGSS Pathway - Successful completion of *Physics of the Universe*, *Biology: The Living Earth*, and *concurrently* enrolled in *Chemistry in the Earth System*.

**Required Course Materials:** Electronic Device (Tablet, iPad, Laptop with charger), binder with lined loose leaf paper or spiral notebook, graph paper, pens, pencils, highlighters, and colored pencils.

**Summer Assignment:** The summer assignment is due on the first day of class for the Fall semester. This assignment may be acquired from the AP Biology course website (<http://www.rwingerden.com/apbio/SummerAssignment/>) or [ERHS Summer Homework](#) page. This assignment is designed to re-familiarize students with the science of biology, the vast diversity of life, and how evolution serves as a foundation and unites modern biology. Secondly, this assignment serves as a review of the chemical foundation for which all life is built and an introduction to the level of academic dedication and maturity necessary to be successful in AP Biology.

**Grades** are calculated on a percentage basis. The value of each individual assignment varies. Students earn a grade based on the **quality, accuracy, and timeliness** of the work they complete. Overall class grades are based on a straight percentage, not a curve.

**Assignments (25%)** At the start of each week, students will have access to the weekly Agenda Page in their AP Biology Canvas Course which will outline the curriculum that will be covered and their responsibilities for the week. Canvas will be used to deliver course content and direct students to other digital tools, such as Albert, AP Classroom, Edpuzzle, Flipgrid, GoFormative, Gizmos, and PIVOT Interaction. Assignments in AP Biology will take many forms and are designed to help with student understanding of the current unit being studied. Additionally, each week there will be readings in the textbook and students will have access to chapter reading guides to assist in the comprehension of content.

**Laboratory (25%)** The laboratory experience is extremely important in the AP Biology course and is used to emphasize that biology and science is a process, which involves the development and testing of a hypothesis, collection, analysis, and presentation of data with a clear discussion of the results. Laboratory experiments reports are required for each of the recommended Inquiry-Based AP Biology Labs\*. These reports may take the form of formal lab write-ups or group whiteboard presentations. Students will work in lab groups to complete lab procedures but are responsible for turning in individual lab reports.

**Assessments (50%)** At the end of each unit, a summative assessment will be given, which will be comprised of both multiple-choice and free-response questions. There will be a comprehensive summative exam at the end of each semester. At a minimum, there will be one formative assessment given each week. Some of these formative assessments will be announced and others will not.

**Late Work:** Late work is accepted, but not for full credit, and maybe turned in anytime *before the scheduled assessment* for the unit the assignment belongs to. Late work will NOT be accepted for credit after the unit assessment.

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\*During the course, students will complete the recommended laboratories in the *AP Biology Investigative Labs: An Inquiry-Based Approach*. The topics covered in these labs are:

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Investigation 1: Artificial Selection

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Investigation 2: Mathematical Modeling; Hardy-Weinberg

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Investigation 3: Comparing DNA Sequences to Understand Evolutionary Relationship with BLAST

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Investigation 4: Diffusion and Osmosis

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Investigation 5: Photosynthesis

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Investigation 6: Cellular Respiration

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Investigation 7: Cell Division: Mitosis and Meiosis

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Investigation 8: Biotechnology: Bacterial Transformation

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Investigation 9: Biotechnology: Restriction Enzyme Analysis

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Investigation 10: Energy Dynamics

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Investigation 11: Transpiration

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Investigation 12: Fruit Fly Behavior

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Investigation 13: Enzyme Activity

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The course also includes additional lab activities, which have been chosen to build an understanding of the recommended laboratory content and emphasize additional topics covered in the 2019 AP Biology CED.

The AP Biology Curriculum is framed around the AP Biology course and **Exam Description Effective Fall 2019** where **Four Big Ideas** serve as the foundation of the course and allow students to create meaningful connections among course concepts. There is a set of core concepts called Enduring Understanding, which will be used to guide the AP Biology course curriculum. Below is an outline of the AP Biology Curriculum Big Ideas and the Enduring Understandings topics covered in this course. ***AP Biology is a rigorous course that demands personal responsibility from the student.***

<b>Big Idea</b>	<b>Enduring Understanding</b>
<p><b>One</b> The process of evolution drives the diversity and unity of life.</p>	<p>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.</p>
<p><b>Two</b> Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis.</p>	<p>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.</p>
<p><b>Three</b> Living systems retrieve, transmit, and respond to information essential to life processes.</p>	<p>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.</p>
<p><b>Four</b> <i>Biological systems interact and these interactions possess complex properties.</i></p>	<p>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.</p>

There are **Eight Units** in AP Biology. Each unit is broken down into topics. The pacing of these topics is in line with their weighting on the multiple-choice section of the AP Biology Exam.

<b>Unit</b>	<b>Exam Weighting</b>
<b>Unit 1:</b> Chemistry of Life	8-11%
<b>Unit 2:</b> Cell Structure and Function	10-13%
<b>Unit 3:</b> Cellular Energetics	12-16%
<b>Unit 4:</b> Cell Communication and Cell Cycle	10-15%
<b>Unit 5:</b> Heredity	8-11%
<b>Unit 6:</b> Gene Expression and Regulation	12-16%
<b>Unit 7:</b> Natural Selection	13-20%
<b>Unit 8:</b> Ecology	10-15%

# AP Biology 2022-2022

## STATEMENT OF UNDERSTANDING

By **completing** and **submitting** the **AP Biology Science** 2022-2023 STATEMENT OF UNDERSTANDING page, the parent/guardian and the student are acknowledging that they have read the course syllabus for Mrs. Wingerden's **AP Biology Science** class and they *understand* and *agree* to the commitment necessary to be successful in this course.

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printed student name / period

\_\_\_\_\_/\_\_\_\_\_  
signature of student / date

\_\_\_\_\_/\_\_\_\_\_  
signature of parent or guardian / date

Please **submit completed** STATEMENT OF UNDERSTANDING to **Canvas** Assignment.

**AP Biology Syllabus 2022-2023**